

2

Time Value of Money

Learning Objectives

After studying this chapter you will be able to:

- ◆ Understand the Concept of time value of money.
- ◆ Understand the relationship between present and future value of money and how interest rate is used to adjust the value of cash flows in-order to arrive at present (discounting) or future (compounding) values.
- ◆ Understand how to calculate the present or future value of an annuity?
- ◆ Know how to use interest factor table's in order to calculate the present or future values?

Overview

This chapter basically tries to impart you the concept and importance of monies worth today as compared to in the future. It talks about present value and future value of your money or investment. It discusses the concept of opportunity cost and the importance to know how to compute the time value of money so that you can distinguish between the worth of investments that offer you returns at different times. This chapter is of utmost importance as other chapters will expand on the concepts learnt in this chapter. For instance, time value concept forms the basis of all the modern tools and techniques of capital budgeting decisions like net present value (NPV) method, internal rate of return method (IRR) to name a few dealt in Chapter Six under Investment Decisions.

2.1 Concept of Time Value of Money

Let's start a discussion on Time Value of Money by taking a very simple scenario. If you are offered the choice between having ₹ 10,000 today and having ₹ 10,000 at a future date, you will usually prefer to have ₹ 10,000 now. Similarly, if the choice is between paying ₹ 10,000 now or paying the same ₹ 10,000 at a future date, you will usually prefer to pay ₹ 10,000 later. It is simple common sense. In the first case by accepting ₹ 10,000 early, you can simply put the money in the bank and earn some interest. Similarly in the second case by deferring the payment, you can earn interest by keeping the money in the bank.

Therefore the time gap allowed helps us to make some money. This incremental gain is time value of money.

Now let me ask a question, if the bank interest was zero (which is generally not the case), what would be the time value of money? As you rightly guessed it would also be zero.

As we understood above, the interest plays an important role in determining the time value of money. Interest rate is the cost of borrowing money as a yearly percentage. For investors, interest rate is the rate earned on an investment as a yearly percentage.

2.2 Reasons Why Money in the Future is Worth Less Than Similar Money Today

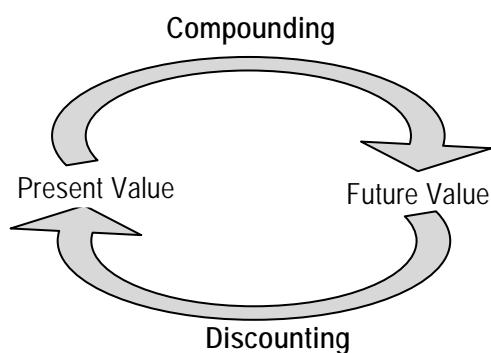
There are three reasons why money can be more valuable today than in the future. Let's discuss them:

- (i) **Preference for Present Consumption:** Individuals have a preference for current consumption in comparison to future consumption. In order to forego the present consumption for a future one, they need a strong incentive. Say for example, if the individual's present preference is very strong then he has to be offered a very high incentive to forego it like a higher rate of interest and vice versa.
- (ii) **Inflation:** Inflation means when prices of things rise faster than they actually should. When there is inflation, the value of currency decreases over time. If the inflation is more, then the gap between the value of money today to the value of money in future is more. So, greater the inflation, greater is the gap and vice versa.
- (iii) **Risk:** Risk of uncertainty in the future lowers the value of money. Say for example, non-receipt of payment, uncertainty of investor's life or any other contingency which may result in non-payment or reduction in payment.

Time value of money results from the concept of interest. So it is now time to discuss Interest.

2.3 Compounding and Discounting

Compounding is the process of calculating future values of cash flows where discounting means finding present value of cash flows.



2.4 Simple Interest & Compound Interest

2.4.1 Simple Interest: It may be defined as Interest that is calculated as a simple percentage of the original principal amount. Please note the word "Original". The formula for calculating simple interest is:

$$SI = P_0 (i)(n)$$

Where,

SI = simple interest in rupees

P₀ = original principal

i = interest rate per time period (in decimals)

n = number of time periods

If we add principal to the interest i.e. P₀ + P₀ (i)(n), we will get the total future value (FV).

2.4.2 Compound Interest: If interest is calculated on original principal amount it is simple interest. When interest is calculated on total of previously earned interest and the original principal it compound interest. Naturally, the amount calculated on the basis of compound interest rate is higher than when calculated with the simple rate.

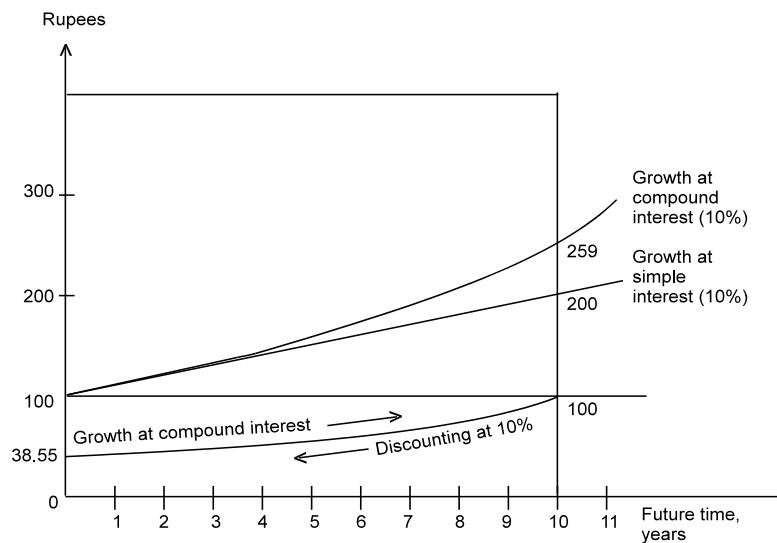
The Magic of Compound Interest – Rule of 72

(It depicts the effect of compounding ₹ 1,000 lump sum at various ages and interest rates).

	Age of an Individual	Interest Rate							
Divide 72 by the interest rate or inflation rate to estimate the number of years it takes for your money to double for or against you.	25	4%	37	6%	52	8%	61	12%	
	43	1,000	34	1,000	43	1,000	31	1,000	
	61	2,000	49	2,000	49	2,000	37	2,000	
	79	4,000	43	4,000	43	4,000	31	4,000	
		8,000	25	8,000	25	8,000	25	8,000	
			73	16,000	61	16,000	49	16,000	
			85	32,000	70	32,000	55	32,000	
				79	64,000	61	64,000	67	64,000
					73	128,000	73	128,000	
					79	256,000	79	256,000	
						79	512,000	79	512,000

2.4.3 Compound Interest versus Simple Interest: The given figure shows graphically the differentiation between compound interest and simple interest. The top two ascending lines show the growth of ₹ 100 invested at simple and compound interest. The

longer the funds are invested, the greater the advantage with compound interest. The bottom line shows that ₹ 38.55 must be invested now to obtain ₹ 100 after 10 periods. Conversely, the present value of ₹ 100 to be received after 10 years is ₹ 38.55.



Compound Interest versus Simple Interest

2.4.4 Future Value: This is also known as terminal value. The accrued amount FV_n on a principal P_0 after n payment periods at i (in decimal) rate of interest per payment period is given by:

$$FV_n = P_0 (1 + i)^n,$$

Where,

$$i = \frac{\text{Annual rate of interest}}{\text{Number of payment periods per year}} = \frac{r}{k}.$$

$(1 + i)^n$ is known as future value factor or compound value factor.

So $FV_n = P_0 \left(1 + \frac{r}{k}\right)^n$, when compounding is done k times a year at an annual interest rate r .

Or

$$FV_n = P_0 (FVIF_{i,n}),$$

Where,

$FVIF_{i,n}$ is the future value interest factor at $i\%$ for n periods equal $(1 + i)^n$.

Computation of FV_n shall be quite simple with a calculator. However, compound interest tables as well as tables for $(1+i)^n$ at various rates per annum with (a) annual compounding; (b) monthly compounded and (c) daily compounding are available.

Illustration 1: Determine the compound interest for an investment of ₹ 7,500 at 6 % compounded half-yearly. Given that $(1+i)^n$ for $i = 0.03$ and $n = 12$ is 1.42576.

Solution

$$i = \frac{6}{2 \times 100} = 0.03, \quad n = 6 \times 2 = 12, \quad P = 1,000$$

$$\text{Compound Amount} = 7,500(1+0.03)^{12} = 7,500 \times 1.42576 = 10,693.20$$

$$\text{Compound Interest} = 10,693.20 - 7,500 = 3,193.20$$

Illustration 2: ₹ 2,000 is invested at annual rate of interest of 10%. What is the amount after 2 years if the compounding is done?

- (a) Annually? (b) Semi annually? (c) Monthly? (d) Daily?

Solution

- (a) The annual compounding is given by:

$$\begin{aligned} FV_2 &= P(1 + i)^n, \text{ n being 2, i being } \frac{10}{100} = 0.1 \text{ and P being } 2,000 \\ &= 2,000 (1.1)^2 = 2,000 \times 1.21 = ₹ 2,420 \end{aligned}$$

- (b) For Semiannual compounding, $n = 2 \times 2 = 4$, $i = 0.1/2 = 0.05$

$$FV_4 = 2,000 (1 + 0.05)^4 = 2,000 \times 1.2155 = ₹ 2,431$$

- (c) For monthly compounding, $n = 12 \times 2 = 24$, $i = 0.1/12 = 0.00833$

$$FV_{24} = 2,000 (1.00833)^{24} = 2,000 \times 1.22029 = ₹ 2440.58$$

- (d) For daily compounding, $n = 365 \times 2 = 730$, $i = 0.1/(365) = 0.00027$

$$FV_{730} = 2,000 (1.00027)^{730} = 2,000 \times 1.22135 = ₹ 2,442.70$$

Illustration 3: Determine the compound amount and compound interest on ₹ 1,000 at 6% compounded semiannually for 6 years. Given that $(1+i)^n = 1.42576$ for $i = 3\%$ and $n = 12$.

Solution

$$i = (6/2) = 3\%, \quad n = 6 \times 2 = 12, \quad P = 1,000$$

$$\begin{aligned} \text{Compound amount} &= P(1 + i)^n = 1,000 (1 + 3\%)^{12} \\ &= 1,000 \times 1.42576 = ₹ 1,425.76 \end{aligned}$$

$$\text{Compound interest} = 1,425.76 - 1,000 = ₹ 425.76$$

Illustration 4: What annual rate of interest compounded annually doubles an investment in 7 years? Given that $2^{1/7} = 1.104090$.

Solution

If the principal be P , $FV_n = 2P$

Since, $FV_n = P(1 + i)^n$,

$$2P = P(1 + i)^7,$$

$$\text{Or, } 2 = (1 + i)^7$$

$$\text{Or, } 2^{1/7} = 1 + i$$

$$\text{Or, } 1.104090 = 1 + i \quad \text{i.e., } i = 0.10409$$

Required rate of interest = 10.41%

Illustration 5: A person opened an account on April, 2012 with a deposit of ₹ 800. The account paid 6% interest compounded quarterly. On October 1, 2012, he closed the account and added enough additional money to invest in a 6-month Time Deposit for ₹ 1,000 earning 6% compounded monthly.

- How much additional amount did the person invest on October 1?
- What was the maturity value of his Time Deposit on April 1, 2013?
- How much total interest was earned?

Given that $(1 + i)^n$ is 1.03022500 for $i = 1\frac{1}{2}\%$, $n = 2$ and is 1.03037751 for $i = \frac{1}{2}\%$ and $n = 6$.

Solution

- The initial investment earned interests for April – June and July – September quarter, i.e. for 2 quarters.

$$\text{In this case, } i = \frac{6}{4} = 1\frac{1}{2}\%, n = 2 \text{ and the compounded amount} = 800 \left(1 + 1\frac{1}{2}\%\right)^2$$

$$= 800 \times 1.03022500 = ₹ 824.18$$

$$\text{The additional amount} = ₹ (1,000 - 824.18) = ₹ 175.82$$

- In this case, the Time Deposit earned interest compounded monthly for 2 quarters.

$$\text{Here, } i = \frac{6}{12} = \frac{1}{2}\%, n = 6, P = 1,000$$

$$\text{Required maturity value } 1,000 \left(1 + \frac{1}{2}\%\right)^6 = 1,000 \times 1.03037751 = ₹ 1,030.38$$

- Total interest earned = $(24.18 + 30.38) = ₹ 54.56$

Illustration 6: Ramanuj has taken a 20 month car loan of ₹ 6,00,000. The rate of interest is 12 per cent per annum. What will be the amount of monthly loan amortization?

Solution

$$A = \frac{\text{₹ } 6,00,000}{\text{PVIFA}_{1, 20}} = \frac{\text{₹ } 6,00,000}{18.0456} = \text{₹ } 33,249.1$$

Monthly interest = 12 per cent/12 = 1 per cent.

2.5 Effective Rate of Interest (EIR)

It is the actual equivalent annual rate of interest at which an investment grows in value when interest is credited more often than once a year. If interest is paid m times in a year it can be found by calculating:

$$E_i = \left(1 + \frac{i}{m}\right)^m - 1$$

Illustration 7: If the interest is 10% payable quarterly, find the effective rate of interest.

Solution

$$E = \left(1 + \frac{0.1}{4}\right)^4 - 1 = 0.1038 \text{ or } 10.38\%$$

2.5.1 Multi-period Compounding: In case of multi period compounding it can be compounded as below:

Conversion Period	Description
1 day	Compounded daily
1 month	Compounded monthly
3 months	Compounded quarterly
6 months	Compounded semiannually
12 months	Compounded annually

The general formula of effective interest rate shall be

$$\text{EIR} = \left(1 + \frac{i}{m}\right)^{n \times m} - 1$$

Daily compounding is also known as continuous compounding.

Effective interest rate can be calculated as

$$\text{EIR} = \left(1 + \frac{i}{365}\right)^{1 \times 365} - 1$$

$$\text{Or, } FV_n = P \times e^{(ixn)} = P \times e^x$$

$$x = (i \times n)$$

$$e = 2.7183$$

2.6 Present Value

Let's first define Present Value. Simple definition is "Present Value" is the current value of a "Future Amount". It can also be defined as the amount to be invested today (Present Value) at a given rate over specified period to equal the "Future Amount".

If we reverse the flow by saying that we expect a fixed amount after n number of years, and we also know the current prevailing interest rate, then by discounting the future amount, at the given interest rate, we will get the present value of investment to be made.

Discounting future amount converts it into present value amount. Similarly, compounding converts present value amount into future value amount.

Therefore, we can say that the present value of a sum of money to be received at a future date is determined by discounting the future value at the interest rate that the money could earn over the period. This process is known as Discounting.

The present value interest rate or the future value interest rate is known as the discount rate. This discount rate is the rate with which the present value or the future value is traded off. A higher discount rate will result in a lower value for the amount in the future. This rate also represents the opportunity cost as it captures the returns that an individual would have made on the next best opportunity.

Since finding present value is simply the reverse of finding Future Value (FV), the formula for Future Value (FV) can be readily transformed into a Present Value formula. Therefore the P_0 , the Present Value becomes:-

$$P_0 = \frac{FV_n}{(1 + i)^n} \text{ OR } P_0 = FV_n (1 + i)^{-n}$$

Where, FV_n = Future value n years hence

i = Rate of interest per annum

n = Number of years for which discounting is done.

As mentioned earlier, computation of P may be simple if we make use of either the calculator or the Present Value table showing values of $(1+i)^{-n}$ for various time periods/per annum interest rates. For positive i , the factor $(1 + i)^{-n}$ is always less than 1, indicating thereby, future amount has smaller present value.

Illustration 8: What is the present value of Re. 1 to be received after 2 years compounded annually at 10%?

Solution

Here $FV_n = 1$, $i = 0.1$

Required Present Value = $FV_n (1+i)^{-n}$

$$= \frac{FV_n}{(1+i)^n} = \frac{1}{(1.1)^2} = \frac{1}{1.21} = 0.8264 = ₹ 0.83$$

Thus, Re. 0.83 shall grow to Re. 1 after 2 years at 10% compounded annually.

Illustration 9: Find the present value of ₹ 10,000 to be required after 5 years if the interest rate be 9 per cent. Given that $(1.09)^5 = 1.5386$

Solution

Here, $i = 0.09$, $n = 5$, $FV_n = 10,000$

$$\begin{aligned}\text{Required Present value} &= FV_n (1 + i)^{-n} \\ &= 10,000 (1.09)^{-5} = 10,000 \times 0.65 = ₹ 6,500.\end{aligned}$$

$$\left[(1.09)^{-5} = \frac{1}{(1.09)^5} = 0.65 \right]$$

Illustration 10: Find out the present value of ₹ 2,000 received after 10 years if discount rate is 8%.

Solution

$$\text{Present value of an amount} = FV_n \left(\frac{1}{1+i} \right)^n$$

Now, $i = 8\%$

$n = 10$ years

$$\begin{aligned}\text{Present value of an amount} &= ₹ 2,000 \left(\frac{1}{1+0.08} \right)^{10} \\ &= ₹ 2,000 (0.463) = ₹ 926\end{aligned}$$

Illustration 11: What is the present value of ₹ 50,000 to be received after 10 years at 10 per cent compounded annually?

Solution

Here $n = 10$, $i = 0.1$

$$\begin{aligned}P &= FV_n (1 + i)^{-n} \\ &= 50,000 (1.1)^{-10} = 50,000 \times 0.385543 = ₹ 19,277.15\end{aligned}$$

Illustration 12: Mr. X has made real estate investment for ₹ 12,000 which he expects will have a maturity value equivalent to interest at 12% compounded monthly for 5 years. If most savings institutions currently pay 8% compounded quarterly on a 5 year term, what is the least amount for which Mr. X should sell his property? Given that $(1 + i)^n = 1.81669670$ for $i = 1\%$ and $n = 60$ and that $(1 + i)^{-n} = 0.67297133$ for $i = 2\%$ and $n = 20$.

Solution

It is a two-part problem. First being determination of maturity value of the investment of ₹ 12,000 and then finding of present value of the obtained maturity value.

Maturity value of the investment may be found from $FV_n = P(1+i)^n$,

Where $P = 12,000$, $i = \frac{12}{12} = 1\%$, $n = 5 \times 12 = 60$.

$$\begin{aligned} \text{Now, } FV_n &= 12,000 (1+1\%)^{60} = 12,000 \times 1.81669670 \\ &= 21,800.3604 = ₹ 21,800.36 \end{aligned}$$

Thus, maturity value of the investment in real estate = ₹ 21,800.36

The present value, P of the amount FV_n due at the end of n interest periods at the rate of $i\%$ interest per period is given by $P = FV_n (1 + i)^{-n}$

We have in the present case, $FV_n = ₹ 21,800.36$, $i = \frac{8}{4} = 2\%$, $n = 5 \times 4 = 20$.

$$\begin{aligned} \text{Thus, } P &= 21,800.36 (1+2\%)^{-20} \\ &= 21,800.36 \times 0.67297133 = ₹ 14,671.02 \end{aligned}$$

Mr. X should not sell the property for less than ₹ 14,671.02

2.7 Annuity

An annuity is a stream of regular periodic payment made or received for a specified period of time. In an ordinary annuity, payments or receipts occur at the end of each period.

2.7.1 Future Value of an Annuity: Expressed algebraically, FVA_n is defined as future (compound) value of an annuity, R the periodic receipt (or payment), and n the length of the annuity, the formula for FVA_n is:-

$$FVA_n = R(I + i)^{n-1} + R(1+i)^{n-2} + \dots + R(I + i)^1 + R(1+i)^0$$

As we can see, FVA_n is simply equal to the periodic receipt (R) times the "sum of the future value interest factors at i percent for time periods 0 to $n-1$.

As a shortcut, If R be the periodic payments, the amount FVA_n of the annuity is given by:

$$FVA_n = R \frac{(1+i)^n - 1}{i}$$

$$\text{OR} \quad FVA_n = R (FVIFA_{i,n})$$

Where $FVIFA_{i,n}$ stands for the future interest factor of an annuity at $i\%$ for n periods.

Table for FVA_n at different rates of interest may be used conveniently, if available, to workout problems. The value of expression $\frac{(1+i)^n - 1}{i}$ or $FVIFA_{i,n}$ can easily be found through financial tables.

Illustration 13: Find the amount of an annuity if payment of ₹ 500 is made annually for 7 years at interest rate of 14% compounded annually.

Solution

$$\text{Here } R = 500, n = 7, i = 0.14$$

$$FVA = ₹ 500 \times FVIFA (7, 0.14) = 500 \times 10.7304915 = ₹ 5,365.25$$

Illustration 14 : A person is required to pay four equal annual payments of ₹ 5,000 each in his deposit account that pays 8% interest per year. Find out the future value of annuity at the end of 4 years.

Solution

$$\begin{aligned} FVA &= R \left(\frac{(1+i)^n - 1}{i} \right) \\ &= ₹ 5,000 (4.507) = ₹ 22,535 \end{aligned}$$

Illustration 15: ₹ 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the amount of this annuity after 10th payment? Given that $(1.005)^{10} = 1.0511$

Solution

We have $A(n,i) = \frac{(1+i)^{n-1}}{i}$, i being the interest rate (in decimal) per payment period over n payment period.

$$\text{Here, } i = 0.06/12 = 0.005, n = 10.$$

$$\text{Required amount is given by } A = P.A (10, 0.005)$$

$$= 200 \times 10.22 = ₹ 2,044.$$

2.7.2 Present Value of an Annuity: Sometimes instead of a single cash flow the cash flows of the same amount is received for a number of years. The present value of an annuity may be expressed as follows:

$$\begin{aligned}
 PVA_n &= \frac{R}{(1+i)^1} + \frac{R}{(1+i)^2} + \dots + \frac{R}{(1+i)^{n-1}} + \frac{R}{(1+i)^n} \\
 &= R \left(\frac{1}{(1+i)^1} + \frac{1}{(1+i)^2} + \dots + \frac{1}{(1+i)^{n-1}} + \frac{1}{(1+i)^n} \right) \\
 &= R (PVIF_{i,1} + PVIF_{i,2} + PVIF_{i,3} + \dots + PVIF_{i,n}) \\
 &= R (PVIF_{i,n})
 \end{aligned}$$

Where,

- PVA_n = Present value of annuity which has duration of n years
- R = Constant periodic flow
- i = Discount rate and,
- $(PVIF_{i,n})$ = Present value interest factor of an (ordinary) annuity at i percent for n periods.

Illustration 16: Find out the present value of a 4 year annuity of ₹ 20,000 discounted at 10 per cent.

Solution	PVA	= Amount of annuity \times Present value (r, n)
	Now, i	= 10%
	N	= 4 years
	PVA	= ₹ 20,000 $\left[\frac{(1+0.1)^4 - 1}{0.1(1+0.1)^4} \right] = ₹ 20,000 \times 3.17 = ₹ 63,400$

Illustration 17: Y bought a TV costing ₹ 13,000 by making a down payment of ₹ 3,000 and agreeing to make equal annual payment for 4 years. How much would be each payment if the interest on unpaid amount be 14% compounded annually?

Solution

In the present case, present value of the unpaid amount was $(13,000 - 3,000) = ₹ 10,000$. The periodic payment, R may be found from

$$R = \frac{PVA}{PVIF(i, n)} = \frac{10,000}{PVIF(0.14, 4)} = \frac{10,000}{2.914} = ₹ 3,431.71$$

Illustration 18: Z plans to receive an annuity of ₹ 5,000 semi-annually for 10 years after he retires in 18 years. Money is worth 9% compounded semi-annually.

(a) How much amount is required to finance the annuity?

(b) What amount of single deposit made now would provide the funds for the annuity?
(c) How much will Mr. Z receive from the annuity?

Solution

(a) Let us first find the required present value for the 10 years annuity by using

$$\begin{aligned} PVA &= R[PVIF(i,n)] \\ &= 5,000 [PVIF(4.5\%, 20)] \\ &= 5,000 \times 13.00793654 = ₹ 65,039.68 \end{aligned}$$

$$\begin{aligned} \text{Since, } PVIF (4.5\%, 20) &= \frac{(1 + 4.5\%)^{20} - 1}{0.045(1 + 4.5\%)^{20}} \\ &= \frac{2.41171402 - 1}{0.10852713} = 13.00793654 \end{aligned}$$

(b) We require the amount of single deposit that matures to ₹ 65,039.68 in 18 years at 9% compounded semi-annually. We use the following formula:-

$$P_0 = FV_n (1 + i)^{-n}$$

$$\text{Where } FV_n = 65,039.68, n = 18 \times 2 = 36, i = \frac{9}{2} = 4 \frac{1}{2}\%, P_0 = ?$$

$$\text{Thus, } P_0 = 65,039.68 \left(1 + 4 \frac{1}{2}\%\right)^{-36} = 65,039.68 \times 0.20502817 = ₹ 13,334.97$$

(c) Required Amount = ₹ 5,000 × 20 = ₹ 1,00,000

Illustration 19: Determine the present value of ₹ 700 each paid at the end of each of the next six years. Assume an 8 per cent of interest.

Solution

As the present value of an annuity of ₹ 700 has to be computed. The present value factor of an annuity of Re. 1 at 8 per cent for 6 years is 4.623. Therefore, the present value of an annuity of ₹ 700 will be: $4.623 \times ₹ 700 = ₹ 3,236.10$

2.8 Loan Amortisation & Capital Recovery

If we receive some amount from the lender at a given rate of interest for a given period then we can calculate the amount of instalment (constant periodic flow) to pay to the lender as an instalment:

$$R = \frac{PVA_n}{PVIFA_{in}}$$

Reciprocal of $PVIF_{in}$ is also known as capital recovery factor (CRF).

Example: Suppose you have borrowed a 3 year loan of ₹1,00,000 at 9 per cent from your employer to buy a motorcycle. If your employer requires three equal end-of-year repayments, then the annual installment will be:

$$R = \frac{PVA_n}{PVIFA_{in}} \text{ or, } R = \frac{\text{₹}1,00,000}{PVIFA_{in}}$$

$$\text{₹} 1,00,000 = R \times PVIFA(0.09, 3 \text{ years})$$

$$\text{₹} 1,00,000 = R \times 2.531 \text{ (from the PVIFA}(i,n) \text{ table)}$$

$$R = \frac{\text{₹}1,00,000}{2.531} = \text{₹} 39,510$$

By paying ₹ 39,510 each year for three years, you shall completely pay-off your loan with 9 per cent interest.

This can be observed from the loan-amortisation schedule given in Table

End of year	Payment	Interest	Principle Repayment	Outstanding Balance
0	--	--	--	1,00,000
1	39,510	9,000	30,510	69,490
2	39,510	6,254	33,256	3,6234
3	39,510	3,261	36,249	0

2.9 Perpetuity

Perpetuity is an annuity in which the periodic payments or receipts begin on a fixed date and continue indefinitely or perpetually. Fixed coupon payments on permanently invested (irredeemable) sums of money are prime examples of perpetuities.

The formula for evaluating perpetuity is relatively straight forward. Two points which are important to understand in this regard are::

- (a) The value of the perpetuity is finite because receipts that are anticipated far in the future have extremely low present value (today's value of the future cash flows).
- (b) Additionally, because the principal is never repaid, there is no present value for the principal.

Therefore the price of perpetuity is simply the coupon amount over the appropriate discount rate or yield.

2.9.1 Calculation of Multi Period Perpetuity: The formula for determining the present value of multi-period perpetuity is as follows:

$$PVA_{\infty} = \frac{R}{(1+i)^1} + \frac{R}{(1+i)^2} + \frac{R}{(1+i)^3} + \dots + \frac{R}{(1+i)^{\infty}} = \sum_{n=1}^{\infty} \frac{R}{(1+i)^n} = \frac{R}{i}$$

Where:

R = the payment or receipt each period

i = the interest rate per payment or receipt period

Illustration 20: Ramesh wants to retire and receive ₹ 3,000 a month. He wants to pass this monthly payment to future generations after his death. He can earn an interest of 8% compounded annually. How much will he need to set aside to achieve his perpetuity goal?

Solution $R = ₹ 3,000$

$$i = 0.08/12 \text{ or } 0.00667$$

Substituting these values in the above formula, we get

$$\begin{aligned} PVA &= \frac{₹ 3,000}{0.00667} \\ &= ₹ 4,49,775 \end{aligned}$$

If he wanted the payments to start today, he must increase the size of the funds to handle the first payment. This is achieved by depositing ₹ 4,52,775 (PV of normal perpetuity + perpetuity received in the beginning = 4,49,775 + 3,000) which provides the immediate payment of ₹ 3,000 and leaves ₹ 4,49,775 in the fund to provide the future ₹ 3,000 payments.

2.9.2 Calculation of Growing Perpetuity: A stream of cash flows that grows at a constant rate forever is known as growing perpetuity.

The formula for determining the present value of growing perpetuity is as follows:

$$\begin{aligned} PVA &= \frac{R}{(1+i)^1} + \frac{R(1+g)}{(1+i)^2} + \frac{R(1+g)^2}{(1+i)^3} + \dots + \frac{R(1+g)^{\infty}}{(1+i)^{\infty}} \\ \sum_{n=1}^{\infty} \frac{R(1+g)^{n-1}}{(1+i)^n} &= \frac{R}{i-g} \end{aligned}$$

Illustration 21: Assuming that the discount rate is 7% per annum, how much would you pay to receive ₹ 50, growing at 5%, annually, forever?

Solution

$$PVA = \frac{R}{i-g} = \frac{50}{0.07 - 0.05} = 2,500$$

2.10 Sinking Fund

It is the fund created for a specified purpose by way of sequence of periodic payments over a time period at a specified interest rate.

Size of the sinking fund deposit is computed from $FVA=R[FVIFA(i,n)]$, where FVA is the amount to be saved, R, the periodic payment, n, the payment period.

Illustration 22: How much amount is required to be invested every year so as to accumulate ₹ 3,00,000 at the end of 10 years if the interest is compounded annually at 10%?

Solution

$$\text{Here, } FVA = 3,00,000 \quad n = 10 \quad i = 0.1$$

$$\text{Since, } FVA = R[FVIFA(i,n)]$$

$$\begin{aligned} 3,00,000 &= R[FVIFA(0.10,10)] \\ &= R * 6.1146 \end{aligned}$$

$$\text{Therefore, } R = \frac{3,00,000}{15.9374248} = 18,823.62 = R = ₹ 18,823.62$$

Illustration 23: ABC Company has issued debentures of ₹ 50 lakhs to be repaid after 7 years. How much should the company invest in a sinking fund earning 12 percent in order to be able to repay debentures?

Solution

$$A (CVFA_{r,i}) = 50,00,000$$

$$A (CVFA_{0.12,7}) = 50,00,000$$

$$A = \frac{50,00,000}{(CVFA_{0.12,7})}$$

$$A = \frac{50,00,000}{10.089}$$

$$= ₹ 4.96 \text{ lakhs.}$$

Illustration 24: XYZ Company is creating a sinking fund to redeem its preference capital of ₹ 10 lakhs issued on April 6, 2012 and maturing on April 5, 2023. The first annual payment will be made on April 6, 2012. The company will make equal annual payments and expects that the fund will earn 12 percent per year. How much will be the amount of sinking fund payment?

Solution

XYZ Company wants to accumulate a future sum of ₹ 10,00,000. Since the annual payments will be made in the beginning of the year, the formula for the compound value of an annuity can be used.

$$\begin{aligned} A(CVFA_{n, i}) (1+i) &= 10,00,000 \\ A(CVFA_{12, 0.12}) (1.12) &= 10,00,000 \\ A(24.133) (1.12) &= 10,00,000 \\ A (27.02896) &= 10,00,000 \\ A = \frac{10,00,000}{27.02896} &= A = ₹ 36,997.35. \end{aligned}$$

Illustration 25: Bank of Delhi pays 8 per cent interest, compounded quarterly, on its money market account. The managers of Bank of Gurgaon want its money market account to equal Bank of Delhi's effective annual rate, but interest is to be compounded on monthly basis. What nominal, or quoted, or APR rate must Bank of Gurgaon set?

Solution

Bank of Delhi's effective annual rate is 8.24 per cent:

$$\text{Effective annual rate} = \left(1 + \frac{0.08}{4}\right)^4 - 1.0 = (1.02)^4 - 1 = 1.0824 - 1 = 0.0824 = 8.24\%.$$

Now, Bank of Gurgaon must have the same effective annual rate:

$$\begin{aligned} \left(1 + \frac{i}{12}\right)^{12} - 1.0 &= 0.0824 \\ \left(1 + \frac{i}{12}\right)^{12} &= 1.0824 \\ 1 + \frac{i}{12} &= (1.0824)^{1/12} \\ 1 + \frac{i}{12} &= 1.00662 \\ \frac{i}{12} &= 0.00662 \\ i &= 0.07944 = 7.94\%. \end{aligned}$$

Thus, the two banks have different quoted rates – Bank of Delhi's quoted rate is 8%, while Bank of Gurgaon's quoted rate is 7.94%; however, both banks have the same effective annual

rate of 8.24%. The difference in their quoted rates is due to the difference in compounding frequency.

SUMMARY

- Money has time value.
- A rupee today is more valuable than a rupee a year hence.
- We use rate of interest to express the time value of money.
- Simple Interest may be defined as Interest that is calculated as a simple percentage of the original principal amount.

Formula : $SI = P_0 (i)(n)$

- Compound interest is calculated on total of previously earned interest and the Original Principal.
- The Present Value of a sum of money to be received at a future date is determined by discounting the future value at the interest rate that the money could earn over the period

$$\text{Formula: } P_0 = \frac{FV_n}{(1 + i)^n} \text{ OR } P_0 = FV_n (1 + i)^{-n}$$

- Future Value is the value at some future time of a present amount of money, or a series of payments, evaluated at a given interest rate.

Formula: $FV_n = P_0 + SI = P_0 + P_0(i)(n)$ or

$$FV_n = P_0 \left(1 + \frac{r}{k}\right)^n$$

- An annuity is a series of equal payments or receipts occurring over a specified number of periods.
 - a. Present value of an ordinary annuity – cash flows occur at the end of each period, and present value is calculated as of one period before the first cash flow.
 - b. Present value of an annuity due – cash flows occur at the beginning of each period, and present value is calculated as of the first cash flow.

Formula: $PVA_n = R (PVIF_{i,n})$

- c. Future value of an ordinary annuity – cash flows occur at the end of each period, and future value is calculated as of the last cash flow.
- d. Future value of an annuity due – cash flows occur at the beginning of each period, and future value is calculated as of one period after the last cash flow.

Formula: $FVA_n = R (FVIFA_{i,n})$

3

Financial Analysis and Planning

UNIT-I:APPLICATION OF RATIO ANALYSIS FOR PERFORMANCE EVALUATION, FINANCIAL HEALTH AND DECISION MAKING

Learning Objectives

After studying this chapter you will be able to:

- Understand the financial analysis of financial statements.
- How Financial Analysis helps in decision making?
- Learn about the important Tools and Techniques of Financial Analysis like ratio analysis. These tools and techniques would help us in analysing the financial health of a company better.

Overview

This chapter requires loads of reading to understand the concepts and thorough practice of the problems. The first unit deals with ratio analysis. Here you need to understand the different types of ratios and their significance alongwith their application in decision-making scenarios. The second unit deals with cashflow and funds flow statement analysis. This chapter draws a lot from the paper of Accounting present in the same group. You should be conceptually clear with respect to the topics covered here as they create a stepping stone for you for understanding and implementation in further chapters.

3.1 Introduction

The basis for financial analysis, planning and decision making is financial statements which mainly consist of Balance Sheet and Profit and Loss Account. The profit & loss account shows the operating activities of the concern and the balance sheet depicts the balance value of the acquired assets and of liabilities at a particular point of time.

However, the above statements do not disclose all of the necessary and relevant information. For the purpose of obtaining the material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise, it is necessary to analyse the data

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depicted in the financial statement.

The financial manager has certain analytical tools which help in financial analysis and planning. The main tools are Ratio Analysis and Cash Flow Analysis. We will first discuss the Ratio Analysis.

3.2 Ratio and Ratio Analysis

Let us first understand the definition of ratio and meaning of ratio analysis

3.2.1 Definition of Ratio: A ratio is defined as "the indicated quotient of two mathematical expressions and as the relationship between two or more things." Here ratio means financial ratio or accounting ratio which is a mathematical expression of the relationship between accounting figures.

3.2.2 Ratio Analysis: The term financial ratio can be explained by defining how it is calculated and what the objective of this calculation is?

a. **Calculation Basis**

- A relationship expressed in mathematical terms;
- Between two individual figures or group of figures;
- Connected with each other in some logical manner; and
- Selected from financial statements of the concern

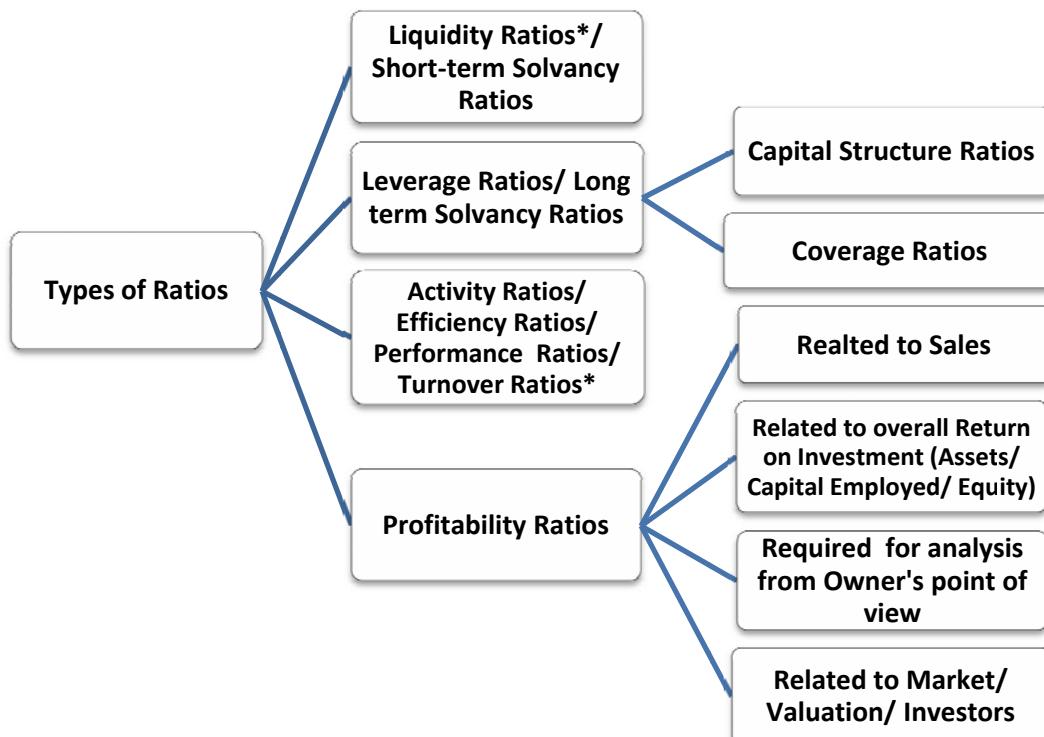
b. **Objective for financial ratios is that all stakeholders (owners, investors, lenders, employees etc.) can draw conclusions about the**

- Performance (past, present and future);
- Strengths & weaknesses of a firm; and
- Can take decisions in relation to the firm.

Ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information.

Ratio analysis is not just comparing different numbers from the balance sheet, income statement, and cash flow statement. It is comparing the number against previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.

3.3 Types of Ratios



Classification of Ratios

**Liquidity ratios should be examined taking relevant turnover ratios into consideration.*

3.3.1 Liquidity Ratios: The terms 'liquidity' and 'short-term solvency' are used synonymously.

Liquidity or short-term solvency means ability of the business to pay its short-term liabilities. Inability to pay-off short-term liabilities affects its credibility as well as its credit rating. Continuous default on the part of the business leads to commercial bankruptcy. Eventually such commercial bankruptcy may lead to its sickness and dissolution. Short-term lenders and creditors of a business are very much interested to know its state of liquidity because of their financial stake. Both lack of sufficient liquidity and excess liquidity is bad for the organization.

Various Liquidity Ratios are:

- (a) Current Ratio
- (b) Quick Ratio or Acid test Ratio

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- (c) Cash Ratio or Absolute Liquidity Ratio
- (d) Basic Defense Interval or Interval Measure Ratios
- (e) Net Working Capital Ratio

(a) **Current Ratio:** The Current Ratio is one of the best known measures of short term solvency. It is the most common measure of short-term liquidity.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Where,

Current Assets = Inventories + Sundry Debtors + Cash and Bank Balances + Receivables/ Accruals + Loans and Advances + Disposable Investments + Any other current assets.

Current Liabilities = Creditors for goods and services + Short-term Loans + Bank Overdraft + Cash Credit + Outstanding Expenses + Provision for Taxation + Proposed Dividend + Unclaimed Dividend + Any other current liabilities.

The main question this ratio addresses is: "Does your business have enough current assets to meet the payment schedule of its current debts with a margin of safety for possible losses in current assets?"

A generally acceptable current ratio is 2 to 1. But whether or not a specific ratio is satisfactory depends on the nature of the business and the characteristics of its current assets and liabilities.

(b) **Quick Ratios:** The Quick Ratio is sometimes called the "acid-test" ratio and is one of the best measures of liquidity.

$$\text{Quick Ratio or Acid Test Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Where,

Quick Assets = Current Assets – Inventories

Current Liabilities = As mentioned under Current Ratio.

The Quick Ratio is a much more conservative measure of short-term liquidity than the Current Ratio. It helps answer the question: "If all sales revenues should disappear, could my business meet its current obligations with the readily convertible quick funds on hand?"

Quick Assets consist of only cash and near cash assets. Inventories are deducted from current assets on the belief that these are not 'near cash assets' and also because in times of financial difficulty inventory may be saleable only at liquidation value. But in a seller's market inventories are also near cash assets.

An acid-test of 1:1 is considered satisfactory unless the majority of "quick assets" are in accounts receivable, and the pattern of accounts receivable collection lags behind the schedule for paying current liabilities.

(c) **Cash Ratio/ Absolute Liquidity Ratio:** The cash ratio measures the absolute liquidity of the business. This ratio considers only the absolute liquidity available with the firm. This ratio is calculated as:

$$\text{Cash Ratio} = \frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

$$\text{Or, } \frac{\text{Cash and Bank balances} + \text{Current Investments}}{\text{Current Liabilities}}$$

The Absolute Liquidity Ratio only tests short-term liquidity in terms of cash and marketable securities/ current investments.

(d) **Basic Defense Interval/ Interval Measure:**

$$\text{Basic Defense Interval} = \frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Operating Expenses} \div \text{No. of days (say 360)}}$$

$$\text{Or, Interval Measure} = \frac{\text{Current Assets} - \text{Inventories}}{\text{Daily Operating Expenses}}$$

$$\text{Daily Operating Expenses} = \frac{\text{Cost of Goods Sold} + \text{Selling, Administration and other General expenses} - \text{Depreciation and other non cash expenditure}}{\text{No. of days in a year}}$$

If for some reason all the company's revenues were to suddenly cease, the Basic Defense Interval would help determine the number of days the company can cover its cash expenses without the aid of additional financing.

(e) **Net Working Capital Ratio:** Net working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. It is calculated as shown below:

$$\text{Net Working Capital Ratio} = \text{Current Assets} - \text{Current Liabilities} \text{ (excluding short-term bank borrowing)}$$

Bankers look at Net Working Capital over time to determine a company's ability to weather financial crises. Loans are often tied to minimum working capital requirements.

3.3.2 Long-term Solvency Ratio /Leverage Ratio: The leverage ratios may be defined as those financial ratios which measure the long term stability and structure of the firm. These ratios indicate the mix of funds provided by owners and lenders and assure the lenders of the long term funds with regard to:

(i) Periodic payment of interest during the period of the loan and

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(ii) Repayment of principal amount on maturity.

Leverage ratios are of two types:

1. Capital Structure Ratios
 - (a) Equity Ratio
 - (b) Debt Ratio
 - (c) Debt to Equity Ratio
 - (d) Debt to Total Assets Ratio
 - (e) Capital Gearing Ratio
 - (f) Proprietary Ratio
2. Coverage Ratios
 - (a) Debt-Service Coverage Ratio (DSCR)
 - (b) Interest Coverage Ratio
 - (c) Preference Dividend Coverage Ratio
 - (d) Fixed Charges Coverage Ratio

3.3.2.1 Capital Structure Ratios: These ratios provide an insight into the financing techniques used by a business and focus, as a consequence, on the long-term solvency position.

From the balance sheet one can get only the absolute fund employed and its sources, but only capital structure ratios show the relative weight of different sources.

Various capital structure ratios are:

(a) Equity Ratio:

$$\text{Equity Ratio} = \frac{\text{Shareholders' Equity}}{\text{Capital Employed}}$$

This ratio indicates proportion of owners' fund to total fund invested in the business. Traditionally, it is believed that higher the proportion of owners' fund lower is the degree of risk.

(b) Debt Ratio:

$$\text{Debt Ratio} = \frac{\text{Total outside liabilities}}{\text{Total Debt} + \text{Net worth}}$$

$$\text{Or, Debt Ratio} = \frac{\text{Total Debt}}{\text{Net Assets}}$$

Total debt or total outside liabilities includes short and long term borrowings from financial institutions, debentures/bonds, deferred payment arrangements for buying capital equipments,

bank borrowings, public deposits and any other interest bearing loan.

This ratio is used to analyse the long-term solvency of a firm.

(c) Debt to Equity Ratio:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}}$$

$$= \frac{\text{Total Debt}^*}{\text{Shareholders' Equity}}$$

Or,

$$= \frac{\text{Long - term Debt}^{**}}{\text{Shareholders' equity}}$$

*Not merely long-term debt.

** Sometimes only interest-bearing, long term debt is used instead of total liabilities (exclusive of current liabilities)

The shareholders' equity is equity and preference share capital + post accumulated profits (excluding fictitious assets etc).

A high debt to equities ratio here means less protection for creditors, a low ratio, on the other hand, indicates a wider safety cushion (i.e., creditors feel the owner's funds can help absorb possible losses of income and capital). This ratio indicates the proportion of debt fund in relation to equity. This ratio is very often referred in capital structure decision as well as in the legislation dealing with the capital structure decisions (i.e. issue of shares and debentures). Lenders are also very keen to know this ratio since it shows relative weights of debt and equity. Debt equity ratio is the indicator of firm's financial leverage.

(d) Debt to Total Assets Ratio: This ratio measures the proportion of total assets financed with debt and, therefore, the extent of financial leverage.

$$\text{Debt to Total Assets Ratio} = \frac{\text{Total Outside Liabilities}}{\text{Total Assets}}$$

$$\text{Or,} \quad = \frac{\text{Total Debt}}{\text{Total Assets}}$$

(e) Capital Gearing Ratio: In addition to debt-equity ratio, sometimes capital gearing ratio is also calculated to show the proportion of fixed interest (dividend) bearing capital to funds belonging to equity shareholders i.e. equity funds or net worth.

$$\text{Capital Gearing Ratio} = \frac{(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds})}{(\text{Equity Share Capital} + \text{Reserves} \& \text{ Surplus} - \text{Losses})}$$

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(f) Proprietary Ratio:

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}}$$

Proprietary fund includes Equity Share Capital + Preference Share Capital + Reserve & Surplus. Total assets exclude fictitious assets and losses.

It indicates the proportion of total assets financed by shareholders.

3.3.2.2 Coverage Ratios: The coverage ratios measure the firm's ability to service the fixed liabilities. These ratios establish the relationship between fixed claims and what is normally available out of which these claims are to be paid. The fixed claims consist of:

- (i) Interest on loans
- (ii) Preference dividend
- (iii) Amortisation of principal or repayment of the instalment of loans or redemption of preference capital on maturity.

The following are important coverage ratios:

(a) Debt Service Coverage Ratio (DSCR): Lenders are interested in debt service coverage to judge the firm's ability to pay off current interest and instalments.

$$\text{Debt Service Coverage Ratio} = \frac{\text{Earnings available for debt services}}{\text{Interest} + \text{Instalments}}$$

Earning for debt service* = Net profit (Earning after taxes) + Non-cash operating expenses like depreciation and other amortizations + Interest +other adjustments like loss on sale of Fixed Asset e.t.c

*Fund from operation (or cash from operation) before interest and taxes also can be considered as per the requirement.

Normally DSCR of 1.5 to 2 is satisfactory. You may note that sometimes in both numerator and denominator lease rentals may be added.

(b) Interest Coverage Ratio: This ratio also known as "times interest earned ratio" indicates the firm's ability to meet interest (and other fixed-charges) obligations. This ratio is computed as:

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest}}$$

Earnings before interest and taxes are used in the numerator of this ratio because the ability to pay interest is not affected by tax burden as interest on debt funds is deductible expense. This ratio indicates the extent to which earnings may fall without causing any embarrassment to the firm regarding the payment of interest charges. A high interest coverage ratio means

that an enterprise can easily meet its interest obligations even if earnings before interest and taxes suffer a considerable decline. A lower ratio indicates excessive use of debt or inefficient operations.

(c) **Preference Dividend Coverage Ratio:** This ratio measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return. This ratio is computed as:

$$\text{Preference Dividend Coverage Ratio} = \frac{\text{Net Profit / Earnings after taxes (EAT)}}{\text{Preference dividend liability}}$$

Earnings after tax is considered because unlike debt on which interest is charged on the profit of the firm, the preference dividend is treated as appropriation of profit.

This ratio indicates margin of safety available to the preference shareholders. A higher ratio is desirable from preference shareholders point of view.

Similarly **Equity Dividend coverage ratio** can also be calculated taking (EAT – Pref. Dividend) and equity fund figures into consideration.

(d) **Fixed Charges Coverage Ratio:** This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. This ratio is more than 1 is considered as safe.

$$\text{Fixed Charges Coverage Ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \frac{\text{Repayment of loan}}{1 - \text{taxrate}}}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes),
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.
3. Numerator should be taken in correspondence with the denominator and vice-versa.

3.3.3 Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio: These ratios are employed to evaluate the efficiency with which the firm manages and utilises its assets. For this reason, they are often called 'Asset management ratios'. These ratios usually indicate the frequency of sales with respect to its assets. These assets may be capital assets or working capital or average inventory.

Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio:

- (a) Total Assets Turnover Ratio

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- (b) Fixed Assets Turnover Ratio
- (c) Capital Turnover Ratio
- (d) Current Assets Turnover Ratio
- (e) Working Capital Turnover Ratio
 - (i) Inventory/ Stock Turnover Ratio
 - (ii) Receivables (Debtors) Turnover Ratio
 - (iii) Payables (Creditors) Turnover Ratio.

These ratios are usually calculated with reference to sales/cost of goods sold and are expressed in terms of rate or times.

Asset Turnover Ratios: Based on different concepts of assets employed, it can be expressed as follows:

(a) **Total Asset Turnover Ratio:** This ratio measures the efficiency with which the firm uses its total assets. This ratio is computed as:

$$\text{Total Asset Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Total Assets}}$$

(b) **Fixed Assets Turnover Ratio:** It measures the efficiency with which the firm uses its fixed assets.

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$$

A high fixed assets turnover ratio indicates efficient utilisation of fixed assets in generating sales. A firm whose plant and machinery are old may show a higher fixed assets turnover ratio than the firm which has purchased them recently.

(c) **Capital Turnover Ratio/ Net Asset Turnover Ratio:**

$$\text{Capital Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$$

This ratio indicates the firm's ability of generating sales/ Cost of Goods Sold per rupee of long term investment. The higher the ratio, the more efficient is the utilisation of owner's and long-term creditors' funds. Net Assets includes Net Fixed Assets and Net Current Assets (Current Assets – Current Liabilities). Since Net Assets equals to capital employed it is also known as Capital Turnover Ratio.

(d) **Current Assets Turnover Ratio:** It measures the efficiency using the current assets by the firm.

Current Assets Turnover Ratio = $\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Current Assets}}$

(e) Working Capital Turnover Ratio:

Working Capital Turnover Ratio = $\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Working Capital}}$

Working Capital Turnover is further segregated into Inventory Turnover, Debtors Turnover, and Creditors Turnover.

Note: Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capital also can be taken.

(i) Inventory/ Stock Turnover Ratio: This ratio also known as stock turnover ratio establishes the relationship between the cost of goods sold during the year and average inventory held during the year. It measures the efficiency with which a firm utilizes or manages its inventory. It is calculated as follows:

Inventory Turnover Ratio = $\frac{\text{Cost of Goods Sold} / \text{Sales}}{\text{Average Inventory}^*}$

*Average Inventory = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$

In the case of inventory of raw material the inventory turnover ratio is calculated using the following formula :

$$\frac{\text{Raw Material Consumed}}{\text{Average Raw Material Stock}}$$

This ratio indicates that how fast inventory is used or sold. A high ratio is good from the view point of liquidity and vice versa. A low ratio would indicate that inventory is not used/ sold/ lost and stays in a shelf or in the warehouse for a long time.

(ii) Receivables (Debtors) Turnover Ratio: In case firm sells goods on credit, the realization of sales revenue is delayed and the receivables are created. The cash is realised from these receivables later on.

The speed with which these receivables are collected affects the liquidity position of the firm. The debtor's turnover ratio throws light on the collection and credit policies of the firm. It measures the efficiency with which management is managing its accounts receivables. It is calculated as follows:

Receivable (Debtor) Turnover Ratio = $\frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$

Receivables (Debtors') Velocity: Debtors' turnover ratio indicates the average collection

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period. However, the average collection period can be directly calculated as follows:

$$\text{Receivable Velocity/ Average Collection Period} = \frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$$

$$\text{Or,} \quad = \frac{12 \text{ months} / 52 \text{ weeks} / 360 \text{ days}}{\text{Receivable Turnover Ratio}}$$

$$\text{Average Daily Credit Sales} = \frac{\text{Credit Sales}}{\text{No. of days in year (say 360)}}$$

The average collection period measures the average number of days it takes to collect an account receivable. This ratio is also referred to as the number of days of receivable and the number of day's sales in receivables.

(iii) Payables Turnover Ratio: This ratio is calculated on the same lines as receivable turnover ratio is calculated. This ratio shows the velocity of payables payment by the firm. It is calculated as follows:

$$\text{Payables Turnover Ratio} = \frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payable}}$$

A low creditor's turnover ratio reflects liberal credit terms granted by supplies. While a high ratio shows that accounts are settled rapidly.

$$\frac{\text{Credit Purchases}}{\text{Average Accounts Payable}}$$

Payable Velocity/ Average payment period can be calculated using:

$$\frac{\text{Average Accounts Payable}}{\text{Average Daily Credit Purchases}}$$

$$\text{Or,} \quad = \frac{12 \text{ months} / 52 \text{ weeks} / 360 \text{ days}}{\text{Payables Turnover Ratio}}$$

In determining the credit policy, debtor's turnover and average collection period provide a unique guideline.

The firm can compare what credit period it receives from the suppliers and what it offers to the customers. Also it can compare the average credit period offered to the customers in the industry to which it belongs.

The above three ratios i.e. Inventory Turnover Ratio/ Receivables Turnover Ratio is also relevant to examine liquidity of an organization.

Notes for calculating Ratios:

1. Only selling & distribution expenses differential Cost of Goods Sold (COGS) and Cost of Sales (COS) in absence of it COGS will be equal to sales.
2. We can consider Cost of Goods Sold/ Cost of Sales to calculate turnover ratios eliminating profit part.
3. Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capital/ also can be taken in calculating the above ratios. Infact when average figures of total assets, net assets, capital employed, shareholders' fund etc. are available it may be preferred to calculate ratios by using this information.
4. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.

3.3.4 Profitability Ratios: The profitability ratios measure the profitability or the operational efficiency of the firm. These ratios reflect the final results of business operations. They are some of the most closely watched and widely quoted ratios. Management attempts to maximize these ratios to maximize firm value.

The results of the firm can be evaluated in terms of its earnings with reference to a given level of assets or sales or owner's interest etc. Therefore, the profitability ratios are broadly classified in four categories:

- (i) Profitability Ratios related to Sales
- (ii) Profitability Ratios related to overall Return on Investment
- (iii) Profitability Ratios required for Analysis from Owner's Point of View
- (iv) Profitability Ratios related to Market/ Valuation/ Investors.

Profitability Ratios are as follows:

1. **Profitability Ratios based on Sales**
 - (a) Gross Profit Ratio
 - (b) Net Profit Ratio
 - (c) Operating Profit Ratio
 - (d) Expenses Ratio
2. **Profitability Ratios related to Overall Return on Assets/ Investments**
 - (a) Return on Investments (ROI)
 - (i) Return on Assets (ROA)
 - (ii) Return of Capital Employed (ROCE)

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- (iii) Return on Equity (ROE)
- 3. Profitability Ratios required for Analysis from Owner's Point of View
 - (a) Earnings per Share (EPS)
 - (b) Dividend per Share (DPS)
 - (c) Dividend Payout Ratio (DP)
- 4. Profitability Ratios related to Market/ Valuation/ Investors
 - (a) Price Earnings (P/E) Ratio
 - (b) Dividend and Earning Yield
 - (c) Market Value/ Book Value per Share (MVBV)
 - (d) Q Ratio

3.3.4.1 Profitability Ratios based on Sales

(a) **Gross Profit (G.P) Ratio/ Gross Profit Margin:** It measures the percentage of each sale in rupees remaining after payment for the goods sold.

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Gross profit margin depends on the relationship between price/ sales, volume and costs. A high Gross Profit Margin is a favourable sign of good management.

(b) **Net Profit Ratio/ Net Profit Margin:** It measures the relationship between net profit and sales of the business. Depending on the concept of net profit it can be calculated as:

$$(i) \text{ Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100 \quad \text{or} \quad \frac{\text{Earnings after taxes (EAT)}}{\text{Sales}} \times 100$$
$$(ii) \text{ Pre-tax Profit Ratio} = \frac{\text{Earnings before taxes (EBT)}}{\text{Sales}} \times 100$$

Net Profit ratio finds the proportion of revenue that finds its way into profits. A high net profit ratio will ensure positive returns of the business.

(c) **Operating Profit Ratio:**

Operating profit ratio is also calculated to evaluate operating performance of business.

$$\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100 \quad \text{or,} \quad \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Sales}} \times 100$$

Where,

Operating Profit = Sales – Cost of Goods sold(COGS) – Expenses

Operating profit ratio measures the percentage of each sale in rupees that remains after the payment of all costs and expenses except for interest and taxes. This ratio is followed closely by analysts because it focuses on operating results. Operating profit is often referred to as earnings before interest and taxes or EBIT.

(d) **Expenses Ratio:** Based on different concepts of expenses it can be expressed in different variants as below:

$$(i) \text{ Cost of Goods Sold (COGS) Ratio} = \frac{\text{COGS}}{\text{Sales}} \times 100$$

$$(ii) \text{ Operating Expenses Ratio} = \frac{\text{Administrative exp. + Selling & Distribution OH}}{\text{Sales}} \times 100$$

$$(iii) \text{ Operating Ratio} = \frac{\text{COGS} + \text{Operating expenses}}{\text{Sales}} \times 100$$

$$(iv) \text{ Financial Expenses Ratio} = \frac{\text{Financial expenses}^*}{\text{Sales}} \times 100$$

**It excludes taxes, loss due to theft, goods destroyed by fire etc.*

Administration Expenses Ratio, Selling & Distribution Expenses Ratio also can be calculated in similar ways.

3.3.4.2 Profitability Ratios related to Overall Return on Assets/ Investments:

(a) **Return on Investment (ROI):** ROI is the most important ratio of all. It is the percentage of return on funds invested in the business by its owners. In short, this ratio tells the owner whether or not all the effort put into the business has been worthwhile. It compares earnings/ returns/ profit with the investment in the company. The ROI is calculated as follows:

$$\text{Return on Investment} = \frac{\text{Return/Profit/Earnings}}{\text{Investment}} \times 100$$

$$\text{Or,} \quad = \frac{\text{Return/Profit/Earnings}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}}$$

$$(i) \frac{\text{Return/Profit/Earnings}}{\text{Sales}} = \text{Profitability Ratio}$$

$$(ii) \text{ Investment Turnover Ratio} = \frac{\text{Sales}}{\text{Investments}}$$

So, $\text{ROI} = \text{Profitability Ratio} \times \text{Investment Turnover Ratio}$. ROI can be improved either by improving Profitability Ratio or Investment Turnover Ratio or by both.

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The concept of investment varies and accordingly there are three broad categories of ROI i.e.

- (i) Return on Assets (ROA),
- (ii) Return on Capital Employed (ROCE) and
- (iii) Return on Equity (ROE).

We should keep in mind that investment may be Total Assets or Net Assets. Further funds employed in net assets are also known as capital employed which is nothing but Net worth plus Debt. Where Net worth is equity shareholders' fund. Similarly the concept of returns/ earnings/ profits may vary as per the requirement and availability of information.

(i) Return on Assets (ROA): The profitability ratio is measured in terms of relationship between net profits and assets employed to earn that profit. This ratio measures the profitability of the firm in terms of assets employed in the firm. Based on various concepts of net profit (return) and assets the ROA may be measured as follows:

$$\text{ROA} = \frac{\text{Net Profit after taxes}}{\text{Average Total Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Tangible Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Fixed Assets}}$$

Here net profit is exclusive of interest. As Assets are also financed by lenders, hence ROA can be calculated as:

$$= \frac{\text{Net Profit after taxes} + \text{Interest}}{\text{Average Total Assets} / \text{Average Tangible Assets} / \text{Average Fixed Assets}}$$

Or, $\frac{\text{EBIT}(1-t)}{\text{Average Total Assets}}$ {also known as **Return on Total Assets (ROTA)**}

Or, $\frac{\text{EBIT}(1-t)}{\text{Average Net Assets}}$ {also known as **Return on Net Assets (RONA)**}

(ii) Return on Capital Employed (ROCE): It is another variation of ROI.

The ROCE is calculated as follows:

$$\text{ROCE (Pre-tax)} = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Capital Employed}} \times 100$$

$$\text{ROCE (Post-tax)} = \frac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100$$

Sometime it is calculated as

$$= \frac{\text{Net Profit after taxes (PAT/EAT)} + \text{Interest}}{\text{Capital Employed}} \times 100$$

Where,

$$\text{Capital Employed} = \text{Total Assets} - \text{Current Liabilities}$$

OR

$$= \text{Fixed Assets} + \text{Working Capital}$$

ROCE should always be higher than the rate at which the company borrows.

Intangible assets (assets which have no physical existence like goodwill, patents and trade marks) should be included in the capital employed. But no fictitious asset should be included within capital employed. If information is available then average capital employed shall be taken.

(iii) Return on Equity (ROE): Return on Equity measures the profitability of equity funds invested in the firm. This ratio reveals how profitably of the owners' funds have been utilised by the firm. It also measures the percentage return generated to equity shareholders. This ratio is computed as:

$$\text{ROE} = \frac{\text{Net Profit after taxes} - \text{Preference dividend (if any)}}{\text{Net worth / equity shareholders' fund}} \times 100$$

Return on equity is one of the most important indicators of a firm's profitability and potential growth. Companies that boast a high return on equity with little or no debt are able to grow without large capital expenditures, allowing the owners of the business to withdraw cash and reinvest it elsewhere. Many investors fail to realize, however, that two companies can have the same return on equity, yet one can be a much better business. If return on total shareholders is calculated then Net Profit after taxes (before preference dividend) shall be divided by total shareholders' fund includes preference share capital. ROE can also be considered under profitability ratio required for analysis from owner's point of view.

Composition of Return on Equity using the DuPont Model:

A finance executive at E.I. Du Pont de Nemours and Co., of Wilmington, Delaware, created the DuPont system of financial analysis in 1919. That system is used around the world today and serves as the basis of components that make up return on equity.

There are three components in the calculation of return on equity using the traditional DuPont model- the net profit margin, asset turnover, and the equity multiplier. By examining each input individually, the sources of a company's return on equity can be discovered and compared to its competitors.

(i) Net Profit Margin: The net profit margin is simply the after-tax profit a company generates for each rupee of revenue. Net profit margins vary across industries, making it important to compare a potential investment against its competitors. Although the general rule-of-thumb is that a higher net profit margin is preferable, it is not uncommon for management to purposely lower the net profit margin in a bid to attract higher sales.

$$\text{Net profit margin} = \text{Net Income} \div \text{Revenue}$$

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Net profit margin is a safety cushion; the lower the margin, the less room for error. A business with 1% margins has no room for flawed execution. Small miscalculations on management's part could lead to tremendous losses with little or no warning.

(ii) **Asset Turnover:** The asset turnover ratio is a measure of how effectively a company converts its assets into sales. It is calculated as follows:

$$\text{Asset Turnover} = \text{Revenue} \div \text{Assets}$$

The asset turnover ratio tends to be inversely related to the net profit margin; i.e., the higher the net profit margin, the lower the asset turnover. The result is that the investor can compare companies using different models (low-profit, high-volume vs. high-profit, low-volume) and determine which one is the more attractive business.

(iii) **Equity Multiplier:** It is possible for a company with terrible sales and margins to take on excessive debt and artificially increase its return on equity. The equity multiplier, a measure of financial leverage, allows the investor to see what portion of the return on equity is the result of debt. The equity multiplier is calculated as follows:

$$\text{Equity Multiplier} = \text{Assets} \div \text{Shareholders' Equity}$$

Calculation of Return on Equity

To calculate the return on equity using the DuPont model, simply multiply the three components (net profit margin, asset turnover, and equity multiplier.)

$$\text{Return on Equity} = (\text{Net Profit Margin}) (\text{Asset Turnover}) (\text{Equity Multiplier})$$

Example: XYZ Company's details are as under:

Revenue: ₹ 29,261; Net Income: ₹ 4,212; Assets: ₹ 27,987; Shareholders' Equity: ₹ 13,572.
Calculate return on equity.

Solution

(i) Net Profit Margin = Net Income (₹ 4,212) ÷ Revenue (₹ 29,261) = 0.1439, or 14.39%

(ii) Asset Turnover = Revenue (₹ 29,261) ÷ Assets (₹ 27,987) = 1.0455

(iii) Equity Multiplier = Assets (₹ 27,987) ÷ Shareholders' Equity (₹ 13,572) = 2.0621

Finally, we multiply the three components together to calculate the return on equity:

$$\begin{aligned}\text{Return on Equity} &= \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier} \\ &= (0.1439) \times (1.0455) \times (2.0621) = 0.3102, \text{ or } 31.02\%\end{aligned}$$

Analysis: A 31.02% return on equity is good in any industry. Yet, if you were to leave out the equity multiplier to see how much company would earn if it were completely debt-free, you will see that the ROE drops to 15.04%. 15.04% of the return on equity was due to profit margins and sales, while 15.96% was due to returns earned on the debt at work in the business. If you found a company at a comparable valuation with the same return on equity yet a higher percentage arose from internally-generated sales, it would be more attractive.

3.3.4.3 Profitability Ratios Required for Analysis from Owner's Point of View

(a) **Earnings per Share (EPS):** The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of number of equity shares. This is known as

Earnings per share. It is calculated as follows:

$$\text{Earnings per Share (EPS)} = \frac{\text{Net profit available to equity share holders}}{\text{Number of equity shares outstanding}}$$

(b) **Dividend per Share (DPS):** Earnings per share as stated above reflects the profitability of a firm per share; it does not reflect how much profit is paid as dividend and how much is retained by the business. Dividend per share ratio indicates the amount of profit distributed to equity shareholders per share. It is calculated as:

$$\text{Dividend per Share (DPS)} = \frac{\text{Total Dividend paid to equity share holders}}{\text{Number of equity shares outstanding}}$$

(c) **Dividend Payout Ratio (DP):** This ratio measures the dividend paid in relation to net earnings. It is determined to see to how much extent earnings per share have been retained by the management for the business. It is computed as:

$$\text{Dividend payout Ratio} = \frac{\text{Dividend per equity share (DPS)}}{\text{Earnings per Share (EPS)}}$$

3.3.4.4 Profitability Ratios related to market/ valuation/ Investors

These ratios involve measures that consider the market value of the company's shares. Frequently share prices data are punched with the accounting data to generate new set of information. These are (a) Price- Earnings Ratio, (b) Dividend Yield, (c) Market Value/ Book Value per share, (d) Q Ratio.

(a) **Price- Earnings Ratio (P/E Ratio):** The price earnings ratio indicates the expectation of equity investors about the earnings of the firm. It relates earnings to market price and is generally taken as a summary measure of growth potential of an investment, risk characteristics, shareholders orientation, corporate image and degree of liquidity. It is calculated as

$$\text{Price-Earnings per Share (P/E Ratio)} = \frac{\text{Market Price per Share (MPS)}}{\text{Earnings per Share (EPS)}}$$

It indicates the payback period to the investors or prospective investors.

(b) **Dividend and Earning Yield:**

$$\text{Dividend Yield} = \frac{\text{Dividend} \pm \text{Change in share price}}{\text{Initial share price}} \times 100$$

Sometime it is calculated as

$$\frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

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This ratio indicates return on investment; this may be on average investment or closing investment. Dividend (%) indicates return on paid up value of shares. But yield (%) is the indicator of true return in which share capital is taken at its market value. Earning Yield also can be calculated as

$$\text{Earnings Yield} = \frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

Also known as Earnings Price (EP) Ratio.

(c) **Market Value /Book Value per Share (MVBV):** It provides evaluation of how investors view the company's past and future performance.

$$\frac{\text{Market value per share}}{\text{Book value per share}} = \frac{\text{Average share price}}{\text{Net worth} \div \text{No. of equity shares}}$$

Or, $\frac{\text{Closing share price}}{\text{Net worth} \div \text{No. of equity shares}}$

This ratio indicates market response of the shareholders' investment. Undoubtedly, higher the ratios better is the shareholders' position in terms of return and capital gains.

(d) **Q Ratio:** This ratio is proposed by James Tobin, a ratio is defined as

$$\frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes),
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. In absence of preference dividend PAT can be taken as earnings available to equity shareholders.
3. If information is available then average capital employed shall be taken while calculating ROCE.
4. Numerator should be taken in correspondence with the denominator and vice-versa.

3.4 Application of Ratio Analysis in Financial Decision Making

A popular technique of analysing the performance of a business concern is that of financial

ratio analysis. As a tool of financial management, they are of crucial significance.

The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.

Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

3.4.1 Financial Ratios for Evaluating Performance

(a) **Liquidity Position:** With the help of ratio analysis one can draw conclusions regarding liquidity position of a firm. The liquidity position of a firm would be satisfactory if it is able to meet its obligations when they become due. This ability is reflected in the liquidity ratios of a firm. The liquidity ratios are particularly useful in credit analysis by banks and other suppliers of short-term loans.

(b) **Long-term Solvency:** Ratio analysis is equally useful for assessing the long-term financial viability of a firm. This aspect of the financial position of a borrower is of concern to the long term creditors, security analysts and the present and potential owners of a business.

The long term solvency is measured by the leverage/capital structure and profitability ratios which focus on earning power and operating efficiency.

The leverage ratios, for instance, will indicate whether a firm has a reasonable proportion of various sources of finance or whether heavily loaded with debt in which case its solvency is exposed to serious strain.

Similarly, the various profitability ratios would reveal whether or not the firm is able to offer adequate return to its owners consistent with the risk involved.

(c) **Operating Efficiency:** Ratio analysis throws light on the degree of efficiency in the management and utilisation of its assets.

The various activity ratios measure this kind of operational efficiency. In fact, the solvency of a firm is, in the ultimate analysis, dependent upon the sales revenues generated by the use of its assets – total as well as its components.

(d) **Overall Profitability:** Unlike the outside parties which are interested in one aspect of the financial position of a firm, the management is constantly concerned about the overall profitability of the enterprise. That is, they are concerned about the ability of the firm to meet its short-term as well as long-term obligations to its creditors, to ensure a reasonable return to its owners and secure optimum utilisation of the assets of the firm. This is possible if an integrated view is taken and all the ratios are considered together.

(e) **Inter-firm Comparison:** Ratio analysis not only throws light on the financial position of a firm but also serves as a stepping stone to remedial measures. This is made possible due to inter-firm comparison/comparison with industry averages.

A single figure of particular ratio is meaningless unless it is related to some standard or

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norm. One of the popular techniques is to compare the ratios of a firm with the industry average. It should be reasonably expected that the performance of a firm should be in broad conformity with that of the industry to which it belongs.

An inter-firm comparison would demonstrate the relative position vis-a-vis its competitors. If the results are at variance either with the industry average or with those of the competitors, the firm can seek to identify the probable reasons and, in the light, take remedial measures.

Ratios not only perform post mortem of operations, but also serve as barometer for future. Ratios have predictory value and they are very helpful in forecasting and planning the business activities for a future. It helps in budgeting.

Conclusions are drawn on the basis of the analysis obtained by using ratio analysis. The decisions affected may be whether to supply goods on credit to a concern, whether bank loans will be made available, etc.

(f) **Financial Ratios for Budgeting:** In this field ratios are able to provide a great deal of assistance, budget is only an estimate of future activity based on past experience, in the making of which the relationship between different spheres of activities are invaluable.

It is usually possible to estimate budgeted figures using financial ratios.

Ratios also can be made use of for measuring actual performance with budgeted estimates. They indicate directions in which adjustments should be made either in the budget or in performance to bring them closer to each other.

3.5 Limitations of Financial Ratios

The limitations of financial ratios are listed below:

- (i) *Diversified product lines:* Many businesses operate a large number of divisions in quite different industries. In such cases ratios calculated on the basis of aggregate data cannot be used for inter-firm comparisons.
- (ii) *Financial data are badly distorted by inflation:* Historical cost values may be substantially different from true values. Such distortions of financial data are also carried in the financial ratios.
- (iii) Seasonal factors may also influence financial data.

Example: A company deals in summer garments. It keeps a high inventory during October - January every year. For the rest of the year its inventory level becomes just 1/4th of the seasonal inventory level.

So liquidity ratios and inventory ratios will produce biased picture. Year end picture may not be the average picture of the business. Sometimes it is suggested to take monthly average inventory data instead of year end data to eliminate seasonal factors. But for external users it is difficult to get monthly inventory figures. (Even in some cases monthly inventory figures may not be available).

- (iv) *To give a good shape to the popularly used financial ratios (like current ratio, debt-equity ratios, etc.):* The business may make some year-end adjustments. Such window dressing can change the character of financial ratios which would be different had there been no such change.
- (v) *Differences in accounting policies and accounting period:* It can make the accounting data of two firms non-comparable as also the accounting ratios.
- (vi) *There is no standard set of ratios against which a firm's ratios can be compared:* Sometimes a firm's ratios are compared with the industry average. But if a firm desires to be above the average, then industry average becomes a low standard. On the other hand, for a below average firm, industry averages become too high a standard to achieve.
- (vii) *It is very difficult to generalise whether a particular ratio is good or bad:* For example, a low current ratio may be said 'bad' from the point of view of low liquidity, but a high current ratio may not be 'good' as this may result from inefficient working capital management.
- (viii) *Financial ratios are inter-related, not independent:* Viewed in isolation one ratio may highlight efficiency. But when considered as a set of ratios they may speak differently. Such interdependence among the ratios can be taken care of through multivariate analysis.

Financial ratios provide clues but not conclusions. These are tools only in the hands of experts because there is no standard ready-made interpretation of financial ratios.

3.6 Summary of Ratios

Another way of categorizing the ratios is being shown to you in a tabular form. A summary of the ratios has been tabulated as under:

Ratio	Formulae	Comments
Liquidity Ratio		
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	A simple measure that estimates whether the business can pay short term debts. Ideal ratio is 2 : 1.
Quick Ratio	$\frac{\text{Quick Assets}}{\text{Current Liabilities}}$	It measures the ability to meet current debt immediately. Ideal ratio is 1 : 1.

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Cash Ratio	$\frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Current Liabilities}}$	It measures absolute liquidity of the business.
Basic Defense Interval Ratio	$\frac{\left(\text{Cash and Bank balances} + \text{Marketable Securities} \right)}{\text{Operating Expenses} \div \text{No. of days}}$	It measures the ability of the business to meet regular cash expenditures.
Net Working Capital Ratio	Current Assets – Current Liabilities	It is a measure of cash flow to determine the ability of business to survive financial crisis.
Capital Structure Ratio		
Equity Ratio	$\frac{\text{Shareholders' Equity}}{\text{Capital Employed}}$	It indicates owner's fund in companies to total fund invested.
Debt Ratio	$\frac{\text{Total outside liabilities}}{\text{Total Debt} + \text{Net worth}}$	It is an indicator of use of outside funds.
Debt to equity Ratio	$\frac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}}$	It indicates the composition of capital structure in terms of debt and equity.
Debt to Total assets Ratio	$\frac{\text{Total Outside Liabilities}}{\text{Total Assets}}$	It measures how much of total assets is financed by the debt.
Capital Gearing Ratio	$\frac{\left(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds} \right)}{\left(\text{Equity Share Capital} + \text{Reserves & Surplus - Losses} \right)}$	It shows the proportion of fixed interest bearing capital to equity shareholders' fund. It also signifies the advantage of financial leverage to the equity shareholder.

Proprietary Ratio	$\frac{\text{Proprietary Fund}}{\text{Total Assets}}$	It measures the proportion of total assets financed by shareholders.
Coverage Ratios		
Debt Service Coverage Ratio (DSCR)	$\frac{\text{Earnings available for debt services}}{\text{Interest} + \text{Instalments}}$	It measures the ability to meet the commitment of various debt services like interest, instalment etc. Ideal ratio is 2.
Interest Coverage Ratio	$\frac{\text{EBIT}}{\text{Interest}}$	It measures the ability of the business to meet interest. Ideal ratio is > 1.
Preference Dividend Coverage Ratio	$\frac{\text{Net Profit} / \text{Earning after taxes (EAT)}}{\text{Preference dividend liability}}$	It measures the ability to pay the preference shareholders' dividend. Ideal ratio is > 1.
Fixed Charges Coverage Ratio	$\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \frac{\text{Re-payment of loan}}{1 - \text{taxrate}}}$	This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. The ideal ratio is > 1.
Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio		
Total Asset Turnover Ratio	$\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Average Total Assets}}$	A measure of total asset utilisation. It helps to answer the question - What sales are being generated by each rupee's worth of assets invested in the business?

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Fixed Assets Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$	This ratio is about fixed asset capacity. A reducing sales or profit being generated from each rupee invested in fixed assets may indicate overcapacity or poorer-performing equipment.
Capital Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$	This indicates the firm's ability to generate sales per rupee of long term investment.
Working Capital Turnover Ratio	$\frac{\text{Sales / COGS}}{\text{Working Capital}}$	It measures the efficiency of the firm to use working capital.
Inventory Turnover Ratio	$\frac{\text{COGS / Sales}}{\text{Average Inventory}}$	It measures the efficiency of the firm to manage its inventory.
Debtors Turnover Ratio	$\frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$	It measures the efficiency at which firm is managing its receivables.
Receivables (Debtors') Velocity	$\frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$	It measures the velocity of collection of receivables.
Payables Turnover Ratio	$\frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$	It measures the velocity of payables payment.
Profitability Ratios based on Sales		
Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Sales}} \times 100$	This ratio tells us something about the

		business's ability consistently to control its production costs or to manage the margins it makes on products it buys and sells.
Net Profit Ratio	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	It measures the relationship between net profit and sales of the business.
Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Sales}} \times 100$	It measures operating performance of business.
Expenses Ratio		
Cost of Goods Sold (COGS) Ratio	$\frac{\text{COGS}}{\text{Sales}} \times 100$	It measures portion of a particular expenses in comparison to sales.
Operating Expenses Ratio	$\frac{(\text{Administrative exp.} + \text{Selling & Distribution OH})}{\text{Sales}} \times 100$	
Operating Ratio	$\frac{\text{COGS} + \text{Operating expenses}}{\text{Sales}} \times 100$	
Financial Expenses Ratio	$\frac{\text{Financial expenses}}{\text{Sales}} \times 100$	
Profitability Ratios related to Overall Return on Assets/ Investments		
Return on Investment (ROI)	$\frac{\text{Return / Profit / Earnings}}{\text{Investments}} \times 100$	It measures overall return of the business on investment/ equity funds/ capital employed/ assets.
Return on Assets (ROA)	$\frac{\text{Net Profit after taxes}}{\text{Average total assets}}$	It measures net profit per rupee of average total assets/ average tangible assets/ average fixed assets.

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Return on Capital Employed ROCE (Pre-tax)	$\frac{EBIT}{Capital Employed} \times 100$	It measures overall earnings (either pre-tax or post tax) on total capital employed.
Return on Capital Employed ROCE (Post-tax)	$\frac{EBIT(1-t)}{Capital Employed} \times 100$	It indicates earnings available to equity shareholders in comparison to equity shareholders' networth.
Return on Equity (ROE)	$\frac{\left(Net Profit after taxes - Preference dividend (if any) \right)}{Net worth / equity shareholders' fund} \times 100$	
Profitability Ratios Required for Analysis from Owner's Point of View		
Earnings per Share (EPS)	$\frac{Net profit available to equity share holders}{Number of equity shares outstanding}$	EPS measures the overall profit generated for each share in existence over a particular period.
Dividend per Share (DPS)	$\frac{Dividend paid to equity share holders}{Number of equity shares outstanding}$	Proportion of profit distributed per equity share.
Dividend payout Ratio (DP)	$\frac{Dividend per equity share}{Earning per Share (EPS)}$	It shows % of EPS paid as dividend and retained earnings.
Profitability Ratios related to market/ valuation/ Investors		
Price-Earnings per Share (P/E Ratio)	$\frac{Market Price per Share (MPS)}{Earning per Share (EPS)}$	At any time, the P/E ratio is an indication of how highly the market "rates" or "values" a business. A P/E ratio is best viewed in the context of a sector or market average to get a feel for relative value and stock

		market pricing.
Dividend Yield	$\frac{\text{Dividend} \pm \text{Change in share price}}{\text{Initial share price}} \times 100$ <p style="text-align: center;">OR</p> $\frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It measures dividend paid based on market price of shares.
Earnings Yield	$\frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It is the relationship of earning per share and market value of shares.
Market Value /Book Value per Share	$\frac{\text{Market value per share}}{\text{Book value per share}}$	It indicates market response of the shareholders' investment.
Q Ratio	$\frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$	It measures market value of equity as well as debt in comparison to all assets at their replacement cost.

Illustration 1 : In a meeting held at Solan towards the end of 2014, the Directors of M/s HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01.01.2015 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:

INCOME STATEMENTS

	2014 (₹)		2015 (₹)	
Cash Sales	30,000		32,000	
Credit Sales	<u>2,70,000</u>	3,00,000	<u>3,42,000</u>	3,74,000
Less: Cost of goods sold		<u>2,36,000</u>		<u>2,98,000</u>
Gross profit		64,000		76,000
Less: Operating Expenses				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	

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<i>Selling</i>	<u>11,000</u>		<u>14,000</u>	
		<u>49,000</u>		<u>2,000</u>
<i>Net Profit</i>		<u>15,000</u>		<u>59,000</u>

BALANCE SHEET

	2014 (₹)	2015 (₹)
<i>Fixed Assets (Net Block)</i>	-	30,000
<i>Receivables</i>	50,000	82,000
<i>Cash at Bank</i>	10,000	7,000
<i>Stock</i>	<u>60,000</u>	<u>94,000</u>
<i>Total Current Assets (CA)</i>	<u>1,20,000</u>	<u>1,83,000</u>
<i>Payables</i>	<u>50,000</u>	<u>76,000</u>
<i>Total Current Liabilities (CL)</i>	<u>50,000</u>	<u>76,000</u>
<i>Working Capital (CA - CL)</i>		<u>70,000</u>
<i>Total Assets</i>		<u>1,00,000</u>
<i>Represented by:</i>		
<i>Share Capital</i>		75,000
<i>Reserve and Surplus</i>		25,000
<i>Debentures</i>		<u>—</u>
		<u>1,00,000</u>
		<u>1,47,000</u>

You are required to calculate the following ratios for the years 2014 and 2015.

- (i) Gross Profit Ratio
- (ii) Operating Expenses to Sales Ratio.
- (iii) Operating Profit Ratio
- (iv) Capital Turnover Ratio
- (v) Stock Turnover Ratio
- (vi) Net Profit to Net Worth Ratio, and
- (vii) Receivables Collection Period.

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of ₹ 40,000 for the year 2014. Ignore Taxation.

Solution

<i>Computation of Ratios</i>			
	2014	2015	
1. Gross profit ratio <i>Gross profit/sales</i>	$\frac{64,000 \times 100}{3,00,000}$ 21.3%	$\frac{76,000 \times 100}{3,74,000}$ 20.3	
2. Operating expense to sales ratio <i>Operating exp / Total sales</i>	$\frac{49,000 \times 100}{3,00,000}$ 16.3%	$\frac{57,000 \times 100}{3,74,000}$ 15.2%	
3. Operating profit ratio <i>Operating profit / Total sales</i>	$\frac{15,000 \times 100}{3,00,000}$ 5%	$\frac{19,000 \times 100}{3,74,000}$ 5.08%	
4. Capital turnover ratio <i>Sales / capital employed</i>	$\frac{3,00,000}{1,00,000} = 3$	$\frac{3,74,000}{1,47,000} = 2.54$	
5. Stock turnover ratio <i>COGS / Average stock</i>	$\frac{2,36,000}{50,000} = 4.7$	$\frac{2,98,000}{77,000} = 3.9$	
6. Net Profit to Networth <i>Net profit / Networth</i>	$\frac{15,000 \times 100}{1,00,000} = 15\%$	$\frac{17,000 \times 100}{1,17,000} = 14.5\%$	
7. <i>Receivables collection period</i> <i>Average receivables / Average daily sales</i> (Refer to working note)	50,000 739.73 67.6 days	82,000 936.99 87.5 days	

Working note:

$$\text{Average daily sales} = \text{Credit sales} / 365$$

$\frac{2,70,000}{365}$	$\frac{3,42,000}{365}$
₹ 739.73	₹ 936.99

Analysis: The decline in the Gross profit ratio could be either due to a reduction in the selling price or increase in the direct expenses (since the purchase price has remained the same).

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Similarly there is a decline in the ratio of Operating expenses to sales. However since operating expenses have little bearing with sales, a decline in this ratio cannot be necessarily be interpreted as an increase in operational efficiency. An in-depth analysis reveals that the decline in the warehousing and the administrative expenses has been partly set off by an increase in the transport and the selling expenses. The operating profit ratio has remained the same in spite of a decline in the Gross profit margin ratio. In fact the company has not benefited at all in terms of operational performance because of the increased sales.

The company has not been able to deploy its capital efficiently. This is indicated by a decline in the Capital turnover from 3 to 2.5 times. In case the capital turnover would have remained at 3 the company would have increased sales and profits by ₹ 67,000 and ₹ 3,350 respectively.

The decline in the stock turnover ratio implies that the company has increased its investment in stock. Return on Networth has declined indicating that the additional capital employed has failed to increase the volume of sales proportionately. The increase in the Average collection period indicates that the company has become liberal in extending credit on sales. However, there is a corresponding increase in the current assets due to such a policy.

It appears as if the decision to expand the business has not shown the desired results.

Illustration 2 : Following is the abridged Balance Sheet of Alpha Ltd. :-

<i>Liabilities</i>	₹	<i>Assets</i>	₹	₹
Share Capital	1,00,000	Land and Buildings		80,000
Profit and Loss Account	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	<u>15,000</u>	<u>35,000</u>
				1,15,000
		Stock	21,000	
		Receivables	20,000	
		Bank	<u>1,000</u>	<u>42,000</u>
Total	<u>1,57,000</u>	Total		<u>1,57,000</u>

With the help of the additional information furnished below, you are required to prepare Trading and Profit & Loss Account and a Balance Sheet as at 31st March, 2013:

(i) The company went in for reorganisation of capital structure, with share capital remaining the same as follows:

Share capital	50%
Other Shareholders' funds	15%
5% Debentures	10%
Payables	25%

Debentures were issued on 1st April, interest being paid annually on 31st March.

(ii) Land and Buildings remained unchanged. Additional plant and machinery has been bought and a further ₹ 5,000 depreciation written off.
 (The total fixed assets then constituted 60% of total gross fixed and current assets.)

(iii) Working capital ratio was 8 : 5.

(iv) Quick assets ratio was 1 : 1.

(v) The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.

(vi) Return on net worth was 10%.

(vii) Gross profit was at the rate of 15% of selling price.

(viii) Stock turnover was eight times for the year.

Ignore Taxation.

Solution

Particulars	%	(₹)
Share capital	50%	1,00,000
Other shareholders funds	15%	30,000
5% Debentures	10%	20,000
Payables	<u>25%</u>	<u>50,000</u>
Total	100%	2,00,000

Land and Buildings

$$\begin{aligned}
 \text{Total liabilities} &= \text{Total Assets} \\
 ₹ 2,00,000 &= \text{Total Assets} \\
 \text{Fixed Assets} &= 60\% \text{ of total gross fixed assets and current assets} \\
 &= ₹ 2,00,000 \times 60/100 = ₹ 1,20,000
 \end{aligned}$$

Calculation of additions to Plant & Machinery

	₹
Total fixed assets	1,20,000
Less: Land & Buildings	80,000
Plant and Machinery (after providing depreciation)	40,000
Depreciation on Machinery up to 31-3-2012	15,000
Add: Further depreciation	<u>5,000</u>
Total	20,000

$$\begin{aligned}
 \text{Current assets} &= \text{Total assets} - \text{Fixed assets} \\
 &= ₹ 2,00,000 - ₹ 1,20,000 = ₹ 80,000
 \end{aligned}$$

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Calculation of stock

$$\begin{aligned}\text{Quick ratio:} &= \frac{\text{Current assets} - \text{stock}}{\text{Current liabilities}} = 1 \\ &= \frac{\text{₹ } 80,000 - \text{stock}}{\text{₹ } 50,000} = 1\end{aligned}$$

$$\begin{aligned}\text{₹ } 50,000 &= \text{₹ } 80,000 - \text{Stock} \\ \text{Stock} &= \text{₹ } 80,000 - \text{₹ } 50,000 \\ &= \text{₹ } 30,000 \\ \text{Receivables} &= 4/5^{\text{th}} \text{ of quick assets} \\ &= (\text{₹ } 80,000 - 30,000) \times 4/5 \\ &= \text{₹ } 40,000\end{aligned}$$

Receivables turnover ratio

$$\begin{aligned}&= \frac{\text{Receivables}}{\text{Credit Sales}} \times 365 \text{ days} = 60 \text{ days} \\ &= \frac{40,000 \times 12}{\text{Credit Sales}} \times 365 = 2 \text{ months}\end{aligned}$$

$$\begin{aligned}2 \text{ credit sales} &= 4,80,000 \\ \text{Credit sales} &= 4,80,000/2 \\ &= 2,40,000\end{aligned}$$

$$\begin{aligned}\text{Gross profit (15% of sales)} \\ \text{₹ } 2,40,000 \times 15/100 &= \text{₹ } 36,000\end{aligned}$$

Return on networth (net profit)

$$\begin{aligned}\text{Net worth} &= \text{₹ } 1,00,000 + \text{₹ } 30,000 \\ &= \text{₹ } 1,30,000 \\ \text{Net profit} &= \text{₹ } 1,30,000 \times 10/100 = \text{₹ } 13,000 \\ \text{Debenture interest} &= \text{₹ } 20,000 \times 5/100 = \text{₹ } 1,000\end{aligned}$$

Projected profit and loss account for the year ended 31-3-2013

To cost of goods sold	2,04,000	By sales	2,40,000
To gross profit	<u>36,000</u>		
	2,40,000		2,40,000
To debenture interest	1,000	By gross profit	36,000
To administration and other expenses	22,000		
To net profit	<u>13,000</u>		
	<u>36,000</u>		<u>36,000</u>

Projected Balance Sheet as at 31st March, 2013

Liabilities	₹	Assets		₹
Share capital	1,00,000	Fixed assets		
Profit and loss A/c	30,000	Land & buildings		80,000
(17,000+13,000)		Plant & machinery	60,000	
5% Debentures	20,000	Less: Depreciation	20,000	40,000
Current liabilities		Current assets		
		Stock	30,000	
Trade creditors	50,000	Debtors	40,000	
	_____	Bank	10,000	<u>80,000</u>
	2,00,000			2,00,000

Illustration 3 : X Co. has made plans for the next year. It is estimated that the company will employ total assets of ₹ 8,00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at ₹ 4,80,000 and all other operating expenses are estimated at ₹ 80,000. the goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent.

You are required to calculate: (i) net profit margin; (ii) return on assets; (iii) asset turnover and (iv) return on owners' equity.

Solution

The net profit is calculated as follows:

	₹	₹
Sales (150% of ₹ 4,80,000)		7,20,000
Direct costs		<u>4,80,000</u>
Gross profit		2,40,000
Operating expenses	80,000	
Interest charges (8% of ₹ 4,00,000)	<u>32,000</u>	<u>1,12,000</u>
Profit before taxes		1,28,000
Taxes (@ 50%)		<u>64,000</u>
Net profit after taxes		<u>64,000</u>

$$(i) \text{ Net profit margin} = \frac{\text{Profit after taxes}}{\text{Sales}} = \frac{\text{₹ } 64,000}{\text{₹ } 7,20,000} = 0.89 \text{ or } 8.9\%$$

$$\text{Net profit margin} = \frac{\text{EBIT} (1 - T)}{\text{Sales}} = \frac{\text{₹ } 1,60,000(1 - .5)}{7,20,000} = 0.111 \text{ or } 11.1\%$$

3.36 Financial Management

$$\begin{aligned}
 \text{(ii)} \quad \text{Return on assets} &= \frac{\text{EBIT (1 - T)}}{\text{Assets}} = \frac{\text{₹ } 1,60,000(1 - .5)}{\text{₹ } 8,00,000} = 0.10 \text{ or } 10\% \\
 \text{(iii)} \quad \text{Asset turnover} &= \frac{\text{Sales}}{\text{Assets}} = \frac{\text{₹ } 7,20,000}{\text{₹ } 8,00,000} = 0.9 \text{ times} \\
 \text{(iv)} \quad \text{Return on equity} &= \frac{\text{Net Profit after taxes}}{\text{Owners' equity}} = \frac{\text{₹ } 64,000}{50\% \text{ of ₹ } 8,00,000} \\
 &= \frac{\text{₹ } 64,000}{\text{₹ } 4,00,000} = 0.16 \text{ or } 16\%
 \end{aligned}$$

Illustration 4 : The total sales (all credit) of a firm are ₹ 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm's current liabilities are ₹ 96,000; inventories ₹ 48,000 and cash ₹ 16,000. (a) Determine the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume a 360 day year). (b) Determine the average collection period if the opening balance of debtors is intended to be of ₹ 80,000? (Assume a 360 day year).

Solution

$$\text{(a) Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.

$$\text{Cost of goods sold} = 0.85 \times ₹ 6,40,000 = ₹ 5,44,000.$$

$$\text{Thus, } = \frac{\text{₹ } 5,44,000}{\text{Average inventory}} = 5$$

$$\text{Average inventory} = \frac{\text{₹ } 5,44,000}{5} = ₹ 1,08,800$$

$$\text{(b) Average collection period} = \frac{\text{Average Receivables}}{\text{Credit Sales}} \times 360 \text{ days}$$

$$\text{Average Receivables} = \frac{(\text{Opening Receivables} + \text{Closing Receivables})}{2}$$

Closing balance of receivables is found as follows:

	₹	₹
Current assets (2.5 of current liabilities)		2,40,000
Less: Inventories	48,000	
Cash	<u>16,000</u>	<u>64,000</u>
.∴ Receivables		<u>1,76,000</u>

$$\text{Average Receivables} = \frac{(\text{₹ } 1,76,000 + \text{₹ } 80,000)}{2}$$

$$\text{₹ } 2,56,000 \div 2 = \text{₹ } 1,28,000$$

$$\text{Average collection period} = \frac{\text{₹ } 1,28,000}{\text{₹ } 6,40,000} \times 360 = 72 \text{ days}$$

Illustration 5: The capital structure of Beta Limited is as follows:

Equity share capital of Rs. 10 each	8,00,000
9% preference share capital of Rs. 10 each	3,00,000
	11,00,000

Additional information: Profit (after tax at 35 per cent), ₹ 2,70,000; Depreciation, ₹ 60,000; Equity dividend paid, 20 per cent; Market price of equity shares, ₹ 40.

You are required to compute the following, showing the necessary workings:

- (a) Dividend yield on the equity shares
- (b) Cover for the preference and equity dividends
- (c) Earnings per shares
- (d) Price-earnings ratio.

Solution

- (a) Dividend yield on the equity shares

$$= \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{\text{₹ } 2 (= 0.20 \times \text{₹ } 10)}{\text{₹ } 40} \times 100 = 5 \text{ per cent}$$

- (b) Dividend coverage ratio

$$(i) \text{ Preference} = \frac{\text{Profit after taxes}}{\text{Dividend payable to preference shareholders}}$$

$$= \frac{\text{₹ } 2,70,000}{\text{₹ } 27,000 (= 0.09 \times \text{₹ } 3,00,000)} = 10 \text{ times}$$

$$(ii) \text{ Equity} = \frac{\text{Profit after taxes} - \text{Preference share dividend}}{\text{Dividend payable to equity shareholders at current rate of Rs. 2 per share}}$$

$$= \frac{\text{₹ } 2,70,000 - \text{₹ } 27,000}{\text{₹ } 1,60,000 (80,000 \text{ shares} \times \text{₹ } 2)} = 1.52 \text{ times}$$

- (c) Earnings per equity share

$$= \frac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares outstanding}} = \frac{\text{₹ } 2,43,000}{80,000} = \text{₹ } 3.04 \text{ per share}$$

3.38 Financial Management

$$(d) \text{ Price-earning (P/E) ratio} = \frac{\text{Market price per share}}{\text{Equity per share}} = \frac{\text{₹ } 40}{\text{₹ } 3.04} = 13.2 \text{ times}$$

Illustration 6 : The following accounting information and financial ratios of PQR Ltd. relate to the year ended 31st December, 2013:

	2013
I Accounting Information:	
Gross Profit	15% of Sales
Net profit	8% of sales
Raw materials consumed	20% of works cost
Direct wages	10% of works cost
Stock of raw materials	3 months' usage
Stock of finished goods	6% of works cost
Debt collection period	60 days
All sales are on credit	
II Financial Ratios:	
Fixed assets to sales	1 : 3
Fixed assets to Current assets	13 : 11
Current ratio	2 : 1
Long-term loans to Current liabilities	2 : 1
Capital to Reserves and Surplus	1 : 4

If value of fixed assets as on 31st December, 2012 amounted to ₹ 26 lakhs, prepare a summarised Profit and Loss Account of the company for the year ended 31st December, 2013 and also the Balance Sheet as on 31st December, 2013.

Solution

(a) Working Notes:

(i) Calculation of Sales

$$\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$$

$$\therefore \frac{26,00,000}{\text{Sales}} = \frac{1}{3} \Rightarrow \text{Sales} = ₹ 78,00,000$$

(ii) Calculation of Current Assets

$$\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11}$$

$$\therefore \frac{26,00,000}{\text{Current Assets}} = \frac{13}{11} \Rightarrow \text{Current Assets} = ₹ 22,00,000$$

(iii) Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	78,00,000
Less: Gross Profit	<u>11,70,000</u>
Works Cost	<u>66,30,000</u>

Raw Material Consumption (20% of Works Cost) ₹ 13,26,000

Direct Wages (10% of Works Cost) ₹ 6,63,000

(iv) Calculation of Stock of Raw Materials (= 3 months usage)

$$= 13,26,000 \times \frac{3}{12} = ₹ 3,31,500$$

(v) Calculation of Stock of Finished Goods (= 6% of Works Cost)

$$= 66,30,000 \times \frac{6}{100} = ₹ 3,97,800$$

(vi) Calculation of Current Liabilities

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 2$$

$$\frac{22,00,000}{\text{Current Liabilities}} = 2 \Rightarrow \text{Current Liabilities} = ₹ 11,00,000$$

(vii) Calculation of Receivables

$$\text{Average collection period} = \frac{\text{Receivables}}{\text{Credit Sales}} \times 365$$

$$\frac{\text{Receivables}}{78,00,000} \times 365 = 60 \Rightarrow \text{Receivables} = ₹ 12,82,191.78 \text{ or } ₹ 12,82,192$$

(viii) Calculation of Long term Loan

$$\frac{\text{Long term Loan}}{\text{Current Liabilities}} = \frac{2}{1}$$

$$\frac{\text{Long term loan}}{11,00,000} = \frac{2}{1} \Rightarrow \text{Long term loan} = ₹ 22,00,000.$$

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(ix) *Calculation of Cash Balance*

₹	
Current assets	22,00,000
Less: Receivables	12,82,192
Raw materials stock	3,31,500
Finished goods stock	<u>3,97,800</u>
Cash balance	<u>20,11,492</u>
	<u>1,88,508</u>

(x) *Calculation of Net worth*

Fixed Assets	26,00,000
Current Assets	<u>22,00,000</u>
Total Assets	48,00,000
Less: Long term Loan	22,00,000
Current Liabilities	<u>11,00,000</u>
Net worth	<u>33,00,000</u>
	<u>15,00,000</u>

Net worth = Share capital + Reserves = 15,00,000

$$\frac{\text{Capital}}{\text{Reserves and Surplus}} = \frac{1}{4} \Rightarrow \text{Share Capital} = 15,00,000 \times \frac{1}{5} = ₹ 3,00,000$$

$$\text{Reserves and Surplus} = 15,00,000 \times \frac{4}{5} = ₹ 12,00,000$$

**Profit and Loss Account of PQR Ltd.
for the year ended 31st December, 2013**

Particulars	₹	Particulars	₹
To Direct Materials	13,26,000	By Sales	78,00,000
To Direct Wages	6,63,000		
To Works (Overhead)	46,41,000		
Balancing figure			
To Gross Profit c/d (15% of Sales)	<u>11,70,000</u>		
	<u>78,00,000</u>		<u>78,00,000</u>
To Selling and Distribution Expenses (Balancing figure)	5,46,000	By Gross Profit b/d	11,70,000
To Net Profit (8% of Sales)	<u>6,24,000</u>		
	<u>11,70,000</u>		<u>11,70,000</u>

**Balance Sheet of PQR Ltd.
as at 31st December, 2013**

Liabilities	₹	Assets	₹
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets:	
Long term loans	22,00,000	Stock of Raw Material	3,31,500
Current liabilities	11,00,000	Stock of Finished Goods	3,97,800
		Receivables	12,82,192
	<u>48,00,000</u>	Cash	<u>1,88,508</u>
			<u>48,00,000</u>

Illustration 7 : Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2013.

<i>Sales</i>	₹ 60,00,000
<i>Return on net worth</i>	25%
<i>Rate of income tax</i>	50%
<i>Share capital to reserves</i>	7:3
<i>Current ratio</i>	2
<i>Net profit to sales</i>	6.25%
<i>Inventory turnover (based on cost of goods sold)</i>	12
<i>Cost of goods sold</i>	₹ 18,00,000
<i>Interest on debentures</i>	₹ 60,000
<i>Receivables</i>	₹ 2,00,000
<i>Payables</i>	₹ 2,00,000

You are required to:

- (a) Calculate the operating expenses for the year ended 31st March, 2013.
- (b) Prepare a balance sheet as on 31st March in the following format:

Balance Sheet as on 31st March, 2013

Liabilities	₹	Assets	₹
<i>Share Capital</i>		<i>Fixed Assets</i>	
<i>Reserve and Surplus</i>		<i>Current Assets</i>	
<i>15% Debentures</i>		<i>Stock</i>	
<i>Payables</i>		<i>Receivables</i>	
		<i>Cash</i>	

3.42 Financial Management

Solution

(a) Calculation of Operating Expenses for the year ended 31st March, 2013.

		₹)
Net Profit [@ 6.25% of Sales]		3,75,000
Add: Income Tax (@ 50%)		<u>3,75,000</u>
Profit Before Tax (PBT)		7,50,000
Add: Debenture Interest		<u>60,000</u>
Profit before interest and tax (PBIT)		<u>8,10,000</u>
Sales		60,00,000
Less: Cost of goods sold	18,00,000	
PBIT	<u>8,10,000</u>	<u>26,10,000</u>
Operating Expenses		<u>33,90,000</u>

(b) Balance Sheet as on 31st March, 2013

Liabilities	₹	Assets	₹
Share Capital	10,50,000	Fixed Assets	17,00,000
Reserve and Surplus	4,50,000	Current Assets:	
15% Debentures	4,00,000	Stock	1,50,000
Payables	2,00,000	Receivables	2,00,000
	<u>21,00,000</u>	Cash	<u>50,000</u>
			<u>21,00,000</u>

Working Notes:

(i) Share Capital and Reserves

The return on net worth is 25%. Therefore, the profit after tax of ₹ 3,75,000 should be equivalent to 25% of the networth.

$$\text{Net worth} \times \frac{25}{100} = ₹ 3,75,000$$

$$\therefore \text{Net worth} = \frac{₹ 3,75,000 \times 100}{25} = ₹ 15,00,000$$

The ratio of share capital to reserves is 7:3

$$\text{Share Capital} = 15,00,000 \times \frac{7}{10} = ₹ 10,50,000$$

$$\text{Reserves} = 15,00,000 \times \frac{3}{10} = ₹ 4,50,000$$

(ii) **Debentures**

$$\text{Interest on Debentures @ 15\%} = ₹ 60,000$$

$$\therefore \text{Debentures} = \frac{60,000 \times 100}{15} = ₹ 4,00,000$$

(iii) **Current Assets**

$$\text{Current Ratio} = 2$$

$$\text{Payables} = ₹ 2,00,000$$

$$\therefore \text{Current Assets} = 2 \text{ Current Liabilities} = 2 \times 2,00,000 = ₹ 4,00,000$$

(iv) **Fixed Assets**

Liabilities:	₹
Share capital	10,50,000
Reserves	4,50,000
Debentures	4,00,000
Payables	<u>2,00,000</u>
	21,00,000
<i>Less: Current Assets</i>	<u>4,00,000</u>
Fixed Assets	17,00,000

(v) **Composition of Current Assets**

$$\text{Inventory Turnover} = 12$$

$$\frac{\text{Cost of goods sold}}{\text{Closing stock}} = 12$$

$$\text{Closing stock} = \frac{₹ 18,00,000}{12} = \text{Closing stock} = ₹ 1,50,000$$

Composition:	(₹)
Stock	1,50,000
Receivables	2,00,000
Cash (balancing figure)	<u>50,000</u>
Total Current Assets	4,00,000

Illustration 8 : ABC Company sells plumbing fixtures on terms of 2/10, net 30. Its financial statements over the last 3 years are as follows:

3.44 Financial Management

	2011	2012	2013
	₹	₹	₹
Cash	30,000	20,000	5,000
Accounts receivable	2,00,000	2,60,000	2,90,000
Inventory	4,00,000	4,80,000	6,00,000
Net fixed assets	<u>8,00,000</u>	<u>8,00,000</u>	<u>8,00,000</u>
	<u>14,30,000</u>	<u>15,60,000</u>	<u>16,95,000</u>
	₹	₹	₹
Accounts payable	2,30,000	3,00,000	3,80,000
Accruals	2,00,000	2,10,000	2,25,000
Bank loan, short-term	1,00,000	1,00,000	1,40,000
Long-term debt	3,00,000	3,00,000	3,00,000
Common stock	1,00,000	1,00,000	1,00,000
Retained earnings	<u>5,00,000</u>	<u>5,50,000</u>	<u>5,50,000</u>
	<u>14,30,000</u>	<u>15,60,000</u>	<u>16,95,000</u>
	₹	₹	₹
Sales	40,00,000	43,00,000	38,00,000
Cost of goods sold	32,00,000	36,00,000	33,00,000
Net profit	3,00,000	2,00,000	1,00,000

Analyse the company's financial condition and performance over the last 3 years. Are there any problems?

Solution

	2011	2012	2013
Current ratio	1.19	1.25	1.20
Acid-test ratio	0.43	0.46	0.40
Average collection period	18	22	27
Inventory turnover	NA*	8.2	6.1
Total debt to net worth	1.38	1.40	1.61
Long-term debt to total capitalization	0.33	0.32	0.32
Gross profit margin	0.200	0.163	0.132
Net profit margin	0.075	0.047	0.026
Asset turnover	2.80	2.76	2.24
Return on assets	0.21	0.13	0.06

Analysis : The company's profitability has declined steadily over the period. As only ₹ 50,000 is added to retained earnings, the company must be paying substantial dividends. Receivables are growing slower, although the average collection period is still very reasonable relative to the terms given. Inventory turnover is slowing as well, indicating a relative buildup in inventories. The increase in receivables and inventories, coupled with the fact that net worth has increased very little, has resulted in the total debt-to-worth ratio increasing to what would have to be regarded on an absolute basis as a high level.

The current and acid-test ratios have fluctuated, but the current ratio is not particularly inspiring. The lack of deterioration in these ratios is clouded by the relative build up in both receivables and inventories, evidencing deterioration in the liquidity of these two assets. Both the gross profit and net profit margins have declined substantially. The relationship between the two suggests that the company has reduced relative expenses in 2012 in particular. The build up in inventories and receivables has resulted in a decline in the asset turnover ratio, and this, coupled with the decline in profitability, has resulted in a sharp decrease in the return on assets ratio.

Illustration 9 : Using the following information, complete this balance sheet:

Long-term debt to net worth	0.5 to 1
Total asset turnover	2.5 ×
Average collection period*	18 days
Inventory turnover	9 ×
Gross profit margin	10%
Acid-test ratio	1 to 1

*Assume a 360-day year and all sales on credit.

	₹		₹
Cash	_____	Notes and payables	1,00,000
Accounts receivable	_____	Long-term debt	_____
Inventory	_____	Common stock	1,00,000
Plant and equipment	_____	Retained earnings	1,00,000
Total assets	_____	Total liabilities and equity	_____

Solution

$$\frac{\text{Long-term debt}}{\text{Net worth}} = 0.5 = \frac{\text{Long-term debt}}{2,00,000}$$

$$\text{Long-term debt} = ₹ 1,00,000$$

$$\text{Total liabilities and net worth} = ₹ 4,00,000$$

$$\text{Total assets} = ₹ 4,00,000$$

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$$\frac{\text{Sales}}{\text{Total assets}} = 2.5 = \frac{\text{Sales}}{4,00,000} = \text{Sales} = ₹ 10,00,000$$

Cost of goods sold = (0.9) (₹ 10,00,000) = ₹ 9,00,000.

$$\frac{\text{Cost of goods sold}}{\text{Inventory}} = \frac{9,00,000}{\text{Inventory}} = 9 = \text{Inventory} = ₹ 1,00,000$$

$$\frac{\text{Receivables} \times 360}{10,00,000} = 18 \text{ days}$$

Receivables = ₹ 50,000

$$\frac{\text{Cash} + 50,000}{1,00,000} = 1$$

Cash = ₹ 50,000

Plant and equipment = ₹ 2,00,000.

Balance Sheet

	₹		₹
Cash	50,000	Notes and payables	1,00,000
Accounts receivable	50,000	Long-term debt	1,00,000
Inventory	1,00,000	Common stock	1,00,000
Plant and equipment	<u>2,00,000</u>	Retained earnings	<u>1,00,000</u>
Total assets	<u>4,00,000</u>	Total liabilities and equity	<u>4,00,000</u>

UNIT-II: CASH FLOW AND FUNDS FLOW ANALYSIS

Learning Objectives

After studying this chapter you will be able to:

- Know the meaning of cash flow statement and define the sources and application of cash.
- Explain the salient features of AS 3 which is important in context of preparation of cash flow statements.
- Explain the features and preparation of fund flow statements.
- Understand the difference between cash flow statement and funds flow statement and their utility and limitations.

3.7 Introduction

A simple definition of a cash flow statement is a statement which discloses the changes in cash position between the two periods. Along with changes in the cash position the cash flow statement also outlines the reasons for such inflows or outflows of cash which in turn helps to analyze the functioning of a business.

3.8 Utility of Cash Flow Analysis

The cash flow statement is an important planning tool in the hands of management. A cash flow statement is useful for short-term planning.

A business enterprise needs sufficient cash to meet its various obligations in the near future such as payment for purchase of fixed assets, payment of debts maturing in the near future, expenses of the business, etc. A historical analysis of the different sources and applications of cash will enable the management to make reliable cash flow projections for the immediate future. It may then plan out for investment of surplus or meeting the deficit, if any.

Its chief advantages and utility are as follows:

1. **Helps in Efficient Cash Management**:- It helps to determine how much cash will be available at a particular point of time to meet obligations like payment to trade creditors, repayment of cash loans, dividends, etc. This helps to provide information about the liquidity and solvency information of an enterprise.
2. **Helps in Internal Financial Management**:- A proper planning of the cash resources will enable the management to make available sufficient cash whenever needed and invest surplus cash, if any in productive and profitable opportunities.
3. **Discloses the Movements of Cash**:- It helps in understanding and analysis of what are the sources and application of the cash for a company. Also it discloses the volume as well as the speed at which the cash flows in the different segments of the business, thereby helping to analyze the different segments of the business.

3.48 Financial Management

4. **Historical versus Future Estimates:-** Historical cash flow information is often used as an indicator of the amount, timing and certainty of future cash flows.
5. **Discloses the Success or Failure of Cash Planning:-** It helps in determining how efficiently the cash is being managed by the management of the business.
6. **Comparison Between Two Enterprises:-** Cash flow information is useful in assessing the ability of the enterprise to generate cash and cash equivalents and enables users to develop models to assess and compare the present value of the future cash flows of different enterprises. It enhances the comparability of the reporting of operating performance by different enterprises because it eliminates the effects of using different accounting treatments for the same transactions and events.
7. **Analysis of Profitability vis-à-vis Net Cash Flow:-** It is also useful in examining the relationship between profitability and net cash flow.

3.9 Limitations of Cash Flow Analysis

Cash flow analysis is a useful tool of financial analysis. However, it has its own limitations. These limitations are as under:

1. **Cash flow statement cannot be equated with the Income Statement.** An Income Statement takes into account both cash as well as non-cash items and, therefore, net cash flow does not necessarily mean net income of the business.
2. **The cash balance as disclosed by the cash flow statement may not represent the real liquid position of the business** since it can be easily influenced by postponing purchases and other payments.
3. **Cash flow statement cannot replace the Funds Flow Statement.** Each of them has a separate function to perform.

In spite of these limitations it can be said that cash flow statement is a useful supplementary instrument.

The technique of cash flow analysis, when used in conjunction with ratio analysis, serves as a barometer in measuring the profitability and financial position of the business.

3.10 AS 3 (Revised) and Cash Flow Statement

The cash flow statement is prepared in accordance with the provisions contended in AS 3 (Revised) issued by the Council of the Institute of Chartered Accountants of India. Students are advised to read the standard thoroughly to learn various intricacies relating to preparation of cash flow statement.

The AS 3 (Revised) while laying down its objectives says that information about the cash flows of an enterprise is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of the enterprise to utilize those cash flows. The economic decisions that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing

and certainty of their generation.

The Statement deals with the provision of information about the historical changes in cash and cash equivalents of an enterprise by means of a cash flow statement which classifies cash flows during the period from operating, investing and financing activities.

3.11 Definitions

AS 3 (Revised) has defined the following terms as follows:

- (a) *Cash* comprises cash on hand and demand deposits with banks.
- (b) *Cash equivalents* are short term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value.
- (c) *Cash flows* are inflows and outflows of cash and cash equivalents.
- (d) *Operating activities* are the principal revenue-producing activities of the enterprise and other activities that are not investing or financing activities.
- (e) *Investing activities* are the acquisition and disposal of long-term assets and other investments not included in cash equivalents.
- (f) *Financing activities* are activities that result in changes in the size and composition of the owners' capital (including preference share capital in the case of a company) and borrowings of the enterprise.

3.12 Cash and Cash Equivalents

Cash equivalents are held for the purpose of meeting short-term cash commitments rather than for investment or other purposes. For an investment to qualify as a cash equivalent, it must be readily convertible to a known amount of cash and be subject to an insignificant risk of changes in value. Therefore, an investment normally qualifies as a cash equivalent only when it has a short maturity of say, three months or less from the date of acquisition.

Investments in shares are excluded from cash equivalents unless they are, in substance, cash equivalents; for example, preference shares of a company acquired shortly before their specified redemption date (provided there is only an insignificant risk of failure of the company to repay the amount at maturity).

3.13 Presentation of Cash Flow Statement

The cash flow statement should report cash flows during the period classified into following categories:-

- a. Operating activities
- b. Investing activities
- c. Financing activities

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Classification by activity provides information that allows users to assess the impact of those activities on the financial position of the enterprise and the amount of its cash and cash equivalents. This information may also be used to evaluate the relationships among those activities.

A single transaction may include mix of cash flows that are classified differently. For example, the instalment paid in respect of a fixed asset acquired on deferred payment basis includes both interest and loan, the interest element is classified under financing activities and the loan element is classified under investing activities.

3.13.1 Operating Activities: Cash flows from operating activities are primarily derived from the principal revenue-producing activities of the enterprise. Therefore, they generally result from the transactions and other events that enter into the determination of net profit or loss. Examples of cash flows from operating activities are:

- (a) Cash receipts from the sale of goods and the rendering of services;
- (b) Cash receipts from royalties, fees, commissions and other revenue;
- (c) Cash payments to suppliers for goods and services;
- (d) Cash payments to and on behalf of employees;
- (e) Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits;
- (f) Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities; and
- (g) Cash receipts and payments relating to futures contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

Some Additional Points

Some transactions, such as the sale of an item of plant, may give rise to a gain or loss which is included in the determination of net profit or loss. However, the cash flows relating to such transactions are cash flows from investing activities.

An enterprise may hold securities and loans for dealing or trading purposes, in which case they are similar to inventory acquired specifically for resale. Therefore, cash flows arising from the purchase and sale of dealing or trading securities are classified as operating activities.

Similarly cash advances and loans made by financial enterprises are usually classified as operating activities since they relate to the main revenue-producing activity of that enterprise.

3.13.2 Investing Activities: The activities of acquisition and disposal of long-term assets and other investments not included in cash equivalents are investing activities. Separate disclosure of cash flows arising from investing activities is important because the cash flows represent the extent to which expenditures have been made for resources intended to generate future income and cash flows.

Examples of cash flows arising from investing activities are:

- (a) Cash payments to acquire fixed assets (including intangibles). These payments include those relating to capitalized research and development costs and self-constructed fixed assets;
- (b) Cash receipts from disposal of fixed assets (including intangibles);
- (c) Cash payments to acquire shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than payments for those instruments considered to be cash equivalents and those held for dealing or trading purposes);
- (d) Cash receipts from disposal of shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than receipts from those instruments considered to be cash equivalents and those held for dealing or trading purposes);
- (e) Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise);
- (f) Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise);
- (g) Cash payments for futures contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes, or the payments are classified as financing activities; and
- (h) Cash receipts from futures contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes, or the receipts are classified as financing activities.

When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedged.

3.13.3 Financing Activities: Financing activities are those activities which result in change in size and composition of owner's capital and borrowing of the organization. The separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprise.

Examples of cash flows arising from financing activities are:

- (a) Cash proceeds from issuing shares or other similar instruments;
- (b) Cash proceeds from issuing debentures, loans, notes, bonds and other short or long-term borrowings; and
- (c) Cash repayments of amounts borrowed.

3.13.4 Special Items Treatment: In addition to the general classification of three types of cash flows, the applicable Accounting Standards provides for the treatment of the cash flows of certain special items as under:

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3.13.4.1 Foreign Currency Cash Flows: Cash flows arising from transactions in a foreign currency should be recorded in an enterprises reporting currency.

The reporting should be done by applying the exchange rate at the date of cash flow statement.

A rate which approximates the actual rate may also be used. If the result is substantially the same as would arise if the rates at the dates of the cash flow were used.

The effect of changes in exchange rates on cash and cash equivalents held in foreign currency should be reported as a separate part in the form of reconciliation in order to reconcile cash and cash equivalents at the beginning and end of the period.

Evidently, unrealised gains and losses arising from changes in foreign exchange rates are not cash flows.

3.13.4.2 Extraordinary Items: Any cash flows relating to extraordinary items should as far as possible classify them into operating, investing or financing activities and those items should be separately disclosed in the cash flow statement. Some of the examples for extraordinary items is bad debts recovered, claims from insurance companies, winning of a law suit or lottery etc.

The above disclosure is in addition to disclosure mentioned in AS-5, 'Net Profit or Loss for the period, prior period items and changes in accounting policies.'

3.13.4.3 Interest and Dividends: Cash flows from interest and dividends received and paid should each be disclosed separately.

The treatment of interest and dividends, received and paid, depends upon the nature of the enterprise i.e., financial enterprises and other enterprises.

- In case of financial enterprises, cash flows arising from interest paid and interest & Dividends received, should be classified as cash flows from operating activities.
- In case of other enterprises, Cash outflows arising from interest paid on terms loans and debentures should be classified as cash outflows from financing activities.
- Cash outflows arising from interest paid on working capital loans should be classified as cash outflow from operating activities.
- Interest and dividends received should be classified as cash inflow from investing activities.
- Dividend paid on equity and preference share capital should be classified as cash outflow from financing activities.

3.13.4.4 Taxes on Income: Cash flows arising from taxes on income should be separately disclosed.

It should be classified as cash flows from operating activities unless they can be specifically identified with financing and investing activities.

3.13.4.5 Investments in Subsidiaries, Associates and Joint Ventures: When accounting for an investment in an associate or a subsidiary or a joint venture, an investor restricts its reporting in the cash flow statement to the cash flows between itself and the investee/joint venture, for example, cash flows relating to dividends and advances.

3.13.4.6 Acquisitions and Disposals of Subsidiaries and Other Business Units: The aggregate cash flows arising from acquisitions and from disposals of subsidiaries or other business units should be presented separately and classified as investing activities.

An enterprise should disclose, in aggregate, in respect of both acquisition and disposal of subsidiaries or other business units during the period each of the following:

- (a) the total purchase or disposal consideration; and
- (b) the portion of the purchase or disposal consideration discharged by means of cash and cash equivalents.

3.13.4.6 Non-Cash Transactions: Investing and financing transactions that do not require the use of cash or cash equivalents should be excluded from a cash flow statement. Such transactions should be disclosed elsewhere in the financial statements in a way that provides all the relevant information about these investing and financing activities. The exclusion of non-cash transactions from the cash flow statement is consistent with the objective of a cash flow statement as these do not involve cash flows in the current period. Examples of non-cash transactions:

- (a) The acquisition of assets by assuming directly related liabilities.
- (b) The acquisition of an enterprise by means of issue of shares.
- (c) Conversion of debt into equity.

3.14 Procedure in Preparation of Cash Flow Statement

The procedure used for the preparation of cash flow statement is as follows:

Calculation of net increase or decrease in cash and cash equivalents accounts: The difference between cash and cash equivalents for the period may be computed by comparing these accounts given in the comparative balance sheets. The results will be cash receipts and payments during the period responsible for the increase or decrease in cash and cash equivalent items.

Calculation of the net cash provided or used by operating activities: It is accomplished by the analysis of Profit and Loss Account, Comparative Balance Sheet and selected additional information.

Calculation of the net cash provided or used by investing and financing activities: All other changes in the Balance sheet items must be analysed taking into account the additional information and effect on cash may be grouped under the investing and financing activities.

Final Preparation of a Cash Flow Statement: It may be prepared by classifying all cash inflows and outflows in terms of operating, investing and financing activities. The net cash flow provided or used in each of these three activities may be highlighted.

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Ensure that the aggregate of net cash flows from operating, investing and financing activities is equal to net increase or decrease in cash and cash equivalents.

Report any significant investing financing transactions that did not involve cash or cash equivalents in a separate schedule to the Cash Flow Statement.

3.14.1 Reporting of Cash Flow from Operating Activities: The financial statements are generally prepared on accrual basis of accounting under which the net income will not indicate the net cash provided by or net loss will not indicate the net cash used in operating activities.

In order to calculate the net cash flows in operating activities, it is necessary to replace revenues and expenses with actual receipts and payments in cash. This is done by eliminating the non-cash revenues and/non-cash expenses from the given earned revenues and incurred expenses.

There are two methods of converting net profit into net cash flows from operating activities-

- (i) Direct method, and
- (ii) Indirect method.

(i) **Direct Method:** Under direct method, actual cash receipts (for a period) from operating revenues and actual cash payments (for a period) for operating expenses are arranged and presented in the cash flow statement. The difference between cash receipts and cash payments is the net cash flow from operating activities.

It is in effect a cash basis Profit and Loss account.

(ii) **Indirect Method:** In this method, the net profit (loss) is used as the base then adjusted for items that affected net profit but did not affect cash.

Non-cash and non-operating charges in the Profit and Loss account are added back to the net profit while non-cash and non-operating credits are deducted to calculate operating profit before working capital changes. It is a partial conversion of accrual basis profit to cash basis profit. Further necessary adjustments are made for increase or decrease in current assets and current liabilities to obtain net cash from operating activities.

3.14.2 Other Disclosure Requirements

An enterprise should disclose, together with a commentary by management, the amount of significant cash and cash equivalent balances held by the enterprise that are *not available for use by it*.

There are various circumstances in which cash and cash equivalent balances held by an enterprise are not available for use by it. Examples include cash and cash equivalent balances held by a branch of the enterprise that operates in a country where exchange controls or other legal restrictions apply as a result of which the balances are not available for use by the enterprise.

Additional information may be relevant to users in understanding the financial position and liquidity of an enterprise. Disclosure of this information, together with a commentary by management, is encouraged and may include:

- (a) the amount of undrawn borrowing facilities that may be available for future operating activities and to settle capital commitments, indicating any restrictions on the use of these facilities; and
- (b) the aggregate amount of cash flows that represent increases in operating capacity separately from those cash flows that are required to maintain operating capacity.

The separate disclosure of cash flows that represent increases in operating capacity and cash flows that are required to maintain operating capacity is useful in enabling the user to determine whether the enterprise is investing adequately in the maintenance of its operating capacity. An enterprise that does not invest adequately in the maintenance of its operating capacity may be prejudicing future profitability for the sake of current liquidity and distributions to owners.

3.14.3 Format of Cash Flow Statement: AS 3 (Revised) has not provided any specific format for the preparation of cash flow statements, but a general idea can be had from the illustration given in the appendix to the Accounting Standard. There seems to be flexibility in the presentation of cash flow statements. However, a widely accepted format under direct method and indirect method is given below:

Option 1:- Cash Flow Statement (Direct Method)		₹
Cash Flow from Operating Activities		
Cash receipts from customers		XXX
Cash paid to suppliers and employees		(xxx)
Cash generated from operations		XXX
Income tax paid		(xxx)
Cash flow before extraordinary items		XXX
Proceeds from earthquake disaster settlement etc		XXX
<i>Net cash from Operating Activities</i>	(a)	XXX
Cash Flows from Investing Activities		
Net Proceeds / (purchase) of fixed assets		(xxx)
Purchase of investments		(xxx)
Interest received		XXX
Dividend received		XXX
<i>Net cash from investing Activities</i>	(b)	XXX

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Cash Flows from Financing Activities				
Proceeds from issue of share capital			XXX	
Net Proceeds/ (Repayments) from long term borrowings			XXX	
Interest paid			(xxx)	
Dividend paid			(xxx)	
<i>Net cash from Financing Activities</i>	(c)			XXX
Net increase / (decrease) in Cash and Cash Equivalent	(a+b+c)			XXX
Cash and Cash Equivalents at beginning of period				XXX
Cash and Cash Equivalent at end of period				XXX
Option 2:- Cash Flow Statement (Indirect Method)				(₹)
Cash Flow from Operating Activities				
Net profit before tax and extraordinary items			XXX	
Adjustments for:				
- Depreciation			XXX	
- Exchange Fluctuation loss/ (gain) – net			XXX	
- Loss on sale of fixed assets			XXX	
- Interest Income			(xxx)	
- Dividend Income			(xxx)	
- Interest Expense			XXX	
- Dividend Paid			XXX	
Operating profit before working capital changes			XXX	
Adjustments for:				
- Trade and other receivables (increase) / decrease			(xxx)	
- Inventories (increase) / decrease			(xxx)	
- Trade payable (decrease) / increase			XXX	
Cash generation from operations			XXX	
- Income Tax			(xxx)	
Cash flow before extraordinary items			XXX	
Proceeds from earthquake disaster settlement etc.			XXX	
<i>Net cash from Operating Activities</i>	(a)			XXX
Cash Flow from Investing Activities				
Net Proceeds / (purchase) of fixed assets			(xxx)	
Purchase of investments			(xxx)	

Interest received		xxx	
Dividend received		xxx	
<u>Net cash from Investing Activities</u>	(b)		Xxx
Cash Flow from Financing Activities			
Proceeds from issue of share capital		xxx	
Net Proceeds/ (Repayments) from long term borrowings		xxx	
Dividend Paid		(xxx)	
Interest Paid		(xxx)	
<u>Net cash from Financing Activities</u>	(c)		xxx
Net increase / (decrease) in Cash and Cash Equivalent	(a+b+c)		xxx
Cash and Cash Equivalents at the beginning of the year		xxx	
Cash and Cash Equivalents at the end of the year		xxx	

Cash from Operations (₹)

Funds from Operations xxx

Add:	Increase in Current Liabilities	(excluding Bank Overdraft)	xxx	
	Decrease in Current Assets	(excluding cash & bank balance)	xxx	xxx
Less:	Increase in Current Assets	(excluding cash & bank balance)	xxx	
	Decrease in Current Liabilities	(excluding bank overdraft)	xxx	xxx

Cash from Operations xxx

The concept and technique of preparing a Cash Flow Statement will be clear with the help of illustrations given in the following pages.

Illustration 10: From the following information prepare a Cash Flow Statement according to (a) Direct Method (b) Indirect Method as per AS 3 (Revised). Working notes would form part of your answer

(1) **BALANCE SHEET**
as on 31.12. 2013

		2013		2012 (₹ in '000)
Assets				
<i>Cash on hand and balances with banks</i>		200		25

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<i>Short-term investments</i>		670		135
<i>Sundry debtors</i>		1,700		1,200
<i>Interest receivable</i>		100		--
<i>Inventories</i>		900		1,950
<i>Long-term investments</i>		2,500		2,500
<i>Fixed assets at cost</i>	2,180		1,910	
<i>Less: Accumulated depreciation</i>	(1,450)		(1,060)	
<i>Fixed assets (net)</i>		730		850
Total Assets		6,800		6,660
		2013		2012
Liabilities				
<i>Sundry creditors</i>		150		1,890
<i>Interest payable</i>		230		100
<i>Income taxes payable</i>		400		1,000
<i>Long-term debt</i>		1,110		1,040
Total liabilities		1,890		4,030
Shareholders' funds				
<i>Share capital</i>		1,500		1,250
<i>Reserves</i>		3,410		1,380
Total shareholders' funds		4,910		2,630
Total Liabilities and Shareholders' funds		6,800		6,660

**(2) STATEMENT OF PROFIT AND LOSS
for the period ended 31.12. 2013**

	(₹ in '000)
<i>Sales</i>	30,650
<i>Cost of sales</i>	(26,000)
<i>Gross profit</i>	4,650
<i>Depreciation</i>	(450)
<i>Administrative and selling expenses</i>	(910)
<i>Interest expense</i>	(400)
<i>Interest income</i>	300
<i>Dividend income</i>	200
<i>Foreign exchange loss</i>	(40)
<i>Net profit before taxation and extraordinary item</i>	3,350
<i>Extraordinary item-</i>	

<i>Insurance proceeds from earthquake disaster settlement</i>	180
<i>Net profit after extraordinary item</i>	3,530
<i>Income tax</i>	(300)
<i>Net Profit</i>	3,230

Additional Information: (Figures in ₹ '000).

- (a) An amount of 250 was raised from the issue of share capital and a further 250 was raised from long-term borrowings.
- (b) Interest expense was 400 of which 170 was paid during the period. 100 relating to interest expense of the prior period was also paid during the period.
- (c) Dividends paid were 1,200.
- (d) Tax deducted at source on dividends received (included in the tax expense of 300 for the year) amounted to 40.
- (e) During the period, the enterprise acquired fixed assets for 350. The payment was made in cash.
- (f) Plant with original cost of 80 and accumulated depreciation of 60 was sold for 20.
- (g) Foreign exchange loss of 40 represents the reduction in the carrying amount of a short-term investment in foreign currency designated bonds arising out of a change in exchange rate between the date of acquisition of the investment and the balance sheet date.
- (h) Sundry debtors and sundry creditors include amounts relating to credit sales and credit purchases only.

Solution

CASH FLOW STATEMENT (Direct Method)

(₹ in '000)

	2013
Cash flows from operating activities	
Cash receipts from customers	30,150
Cash paid to suppliers and employees	(27,600)
Cash generated from operations	2,550
Income taxes paid	(860)
Cash flow before extraordinary item	1,690
Proceeds from earthquake disaster settlement	180
<i>Net cash from operating activities</i>	1,870

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Cash flows from investing activities		
Purchase of fixed assets	(350)	
Proceeds from sale of equipment	20	
Interest received	200	
Dividend received	160	
<i>Net cash from investing activities</i>		30
Cash Flows from financing activities		
Proceeds from issuance of share capital	250	
Proceeds from long-term borrowings	250	
Repayments of long-term borrowings	(180)	
Interest paid	(270)	
Dividend paid	(1,200)	
<i>Net cash used in financing activities</i>		(1,150)
Net increase in cash and cash equivalents		750
Cash and cash equivalents at beginning of period (See Note 1)		160
Cash and cash equivalents at end of period (See Note 1)		910

Notes to the Cash Flow Statement (Direct & Indirect Method)

1 **Cash and cash equivalents:** Cash and cash equivalents consist of cash on hand and balances with banks, and investments in money-market instruments. Cash and cash equivalents included in the cash flow statement comprise the following balance sheet amounts.

	2013	2012
Cash on hand and balances with banks	200	25
Short-term investments	<u>670</u>	<u>135</u>
Cash and cash equivalents	870	160
Effects of exchange rate changes	<u>40</u>	=
Cash and cash equivalents as restated	910	160

Cash and cash equivalents at the end of the period include deposits with banks of 100 held by a branch which are not freely permissible to the company because of currency exchange restrictions.

The company has undrawn borrowing facilities of 2,000 of which 700 may be used only for future expansion.

2. Total tax paid during the year (including tax deducted at source on dividends received) amounted to 900.

CASH FLOW STATEMENT
(Indirect Method)

	(₹ in '000)	2013
Cash flows from operating activities		
Net profit before taxation, and extraordinary item	3,350	
Adjustments for:		
Depreciation	450	
Foreign exchange loss	40	
Interest income	(300)	
Dividend income	(200)	
Interest expense	<u>400</u>	
Operating profit before working capital changes	3,740	
Increase in sundry debtors	(500)	
Decrease in inventories	1,050	
Decrease in sundry creditors	<u>(1,740)</u>	
Cash generated from operations	2,550	
Income taxes paid	<u>(860)</u>	
Cash flows before extraordinary item	1,690	
Proceeds from earthquake disaster settlement	<u>180</u>	
<i>Net cash from operating activities</i>		1,870
Cash flows from investing activities		
Purchase of fixed assets	(350)	
Proceeds from sale of equipment	20	
Interest received	200	
Dividends received	<u>160</u>	
<i>Net cash from investing activities</i>		30
Cash flows from financing activities		
Proceeds from issuance of share capital	250	
Proceeds from long-term borrowings	250	
Repayment of long-term borrowings	(180)	
Interest paid	(270)	
Dividends paid	<u>(1,200)</u>	

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<i>Net cash used in financing activities</i>	(1,150)
Net increase in cash and cash equivalents	750
Cash and cash equivalents at beginning of period (See Note 1)	<u>160</u>
Cash and cash equivalents at end of period (See Note 1)	910

Alternative Presentation (Indirect Method)

As an alternative, in an indirect method cash flow statement, operating profit before working capital changes is sometimes presented as follows:

Revenues excluding investment income	30,650
Operating expenses excluding depreciation	<u>(26,910)</u>
Operating profit before working capital changes	<u>3,740</u>

Working Notes:

The working notes given below do not form part of the cash flow statement. The purpose of these working notes is merely to assist in understanding the manner in which various figures in the cash flow statement have been derived. (Figures are in ₹ '000).

1.	<i>Cash receipts from customers</i>		
	Sales	30,650	
	<i>Add:</i> Sundry debtors at the beginning of the year	<u>1,200</u>	
		31,850	
	<i>Less:</i> Sundry debtors at the end of the year	<u>1,700</u>	
		30,150	
2.	<i>Cash paid to suppliers and employees</i>		
	Cost of sales	26,000	
	Administrative & selling expenses	<u>910</u>	
		26,910	
	<i>Add:</i> Sundry creditors at the beginning of the year	1,890	
	Inventories at the end of the year	<u>900</u>	<u>2,790</u>
		29,700	
	<i>Less:</i> Sundry creditors at the end of the year	150	
	Inventories at the beginning of the year	<u>1,950</u>	<u>2,100</u>
		27,600	
3.	<i>Income taxes paid (including tax deducted at source from dividends received)</i>		
	Income tax expense for the year (including tax deducted at source from dividends received)		300

	Add: Income tax liability at the beginning of the year	<u>1,000</u>
	Less: Income tax liability at the end of the year	1,300
		<u>400</u>
		<u>900</u>
	Out of 900, tax deducted at source on dividends received (amounting to 40), is included in cash flows from investing activities and the balance of 860 is included in cash flows from operating activities.	
4.	<i>Repayment of long-term borrowings</i>	
	Long-term debt at the beginning of the year	1,040
	Add: Long-term borrowings made during the year	<u>250</u>
		1,290
	Less: Long-term borrowings at the end of the year	<u>1,110</u>
		<u>180</u>
5.	<i>Interest paid</i>	
	Interest expense for the year	400
	Add: Interest payable at the beginning of the year	<u>100</u>
		500
	Less: Interest payable at the end of the year	<u>230</u>
		<u>270</u>

Illustration 11: Swastik Oils Ltd. has furnished the following information for the year ended 31st March, 2014:

	(₹ in lakhs)
<i>Net profit</i>	37,500.00
<i>Dividend (including interim dividend paid)</i>	12,000.00
<i>Provision for income-tax</i>	7,500.00
<i>Income-tax paid during the year</i>	6,372.00
<i>Loss on sale of assets (net)</i>	60.00
<i>Book value of assets sold</i>	277.50
<i>Depreciation charged to P&L Account</i>	30,000.00
<i>Profit on sale of investments</i>	150.00
<i>Interest income on investments</i>	3,759.00
<i>Value of investments sold</i>	41,647.50
<i>Interest expenses (due during the year)</i>	15,000.00
<i>Interest paid during the year</i>	15,780.00
<i>Increase in working capital (excluding cash and bank balance)</i>	84,112.50

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<i>Purchase of fixed assets</i>	21,840.00
<i>Investments on joint venture</i>	5,775.00
<i>Expenditure on construction work-in-progress</i>	69,480.00
<i>Proceeds from long-term borrowings</i>	38,970.00
<i>Proceeds from short-term borrowings</i>	30,862.50
<i>Opening cash and bank balances</i>	11,032.50
<i>Closing cash and bank balances</i>	2,569.50

You are required to prepare the cash flow statement in accordance with AS 3 for the year ended 31st March, 2014. (Make assumptions wherever necessary).

Solution

SWASTIK OILS LIMITED
Cash Flow Statement for the Year Ended 31st March, 2014

(a)	Cash Flows from Operating Activities	(₹ in lakhs)
	Net profit before taxation (37,500 + 7,500)	45,000.00
	Adjustment for:	
	Depreciation charged to P&L A/c	30,000.00
	Loss on sale of assets (net)	60.00
	Profit on sale of investments	(150.00)
	Interest income on investments	(3,759.00)
	Interest expenses	15,000.00
	Operating profit before working capital changes	86,151.00
	Increase (change) in working capital (excluding cash and bank balance)	(84,112.50)
	Cash generated from operations	2,038.50
	Income tax paid	(6,372.00)
	Net cash used in operating activities (A)	(4,333.50)
(b)	Cash Flow from investing Activities	
	Sale of Assets (277.50-60.00)	217.50
	Sale of Investments (41,647.50+150)	41,797.50
	Interest Income on investments (assumed)	3,759.00
	Purchase of fixed assets	(21,840.00)
	Investments in Joint Venture	(5,775.00)

	Expenditure on construction work-in-progress	(69,480.00)
	Net Cash used in investing activities (B)	(51,321.00)
(c)	Cash Flow from Financing Activities	
	Proceeds from long-term borrowings	38,970.00
	Proceeds from short-term borrowings	30,862.50
	Interest paid	(15,780.00)
	Dividends (including interim dividend paid)	(12,000.00)
	Net cash from financing activities (C)	42,052.50
	Net increase in cash and cash equivalents (A) + (B) + (C)	(13,602.00)
	Cash and cash equivalents at the beginning of the year	11,032.50
	Cash and cash equivalents at the end of the year	2,569.50

3.15 Funds Flow Analysis

Another important tool in the hands of finance managers for ascertaining the changes in financial position of a firm between two accounting periods is known as funds flow statement. Funds flow statement analyses the reasons for change in financial position between two balance sheets. It shows the inflow and outflow of funds i.e., sources and application of funds during a particular period.

Fund Flow Statement summarizes for a particular period the resources made available to finance the activities of an enterprise and the uses to which such resources have been put. A fund flow statement may serve as supplementary financial information to the users.

3.15.1 Meaning of Fund: 'Fund' means working capital. Working capital is viewed as the difference between current assets and current liabilities. If we see balance sheets of a company for two consecutive years, we can note that working capital in such Balance Sheets are different.

Example: Let us see the Balance Sheets of a company for the year ended 31st March, 2013 and 2014.

	(Rupees in Lacs)	
<i>Current Assets, Loans and Advances:</i>	<i>31.3.2013</i>	<i>31.3.2014</i>
<i>Inventories</i>	15,24	14,91
<i>Sundry Debtors</i>	1,26	1,83
<i>Cash and Bank</i>	1,34	1,66
<i>Other current Assets</i>	8	9
<i>Loans and Advances</i>	11,76	14,74
	29,68	33,23

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Less: Current Liabilities and Provisions:

<i>Liabilities</i>	17,76	14,83
<i>Provision for Taxation</i>	6,22	7,45
<i>Proposed Dividend</i>	65	2,07
	24,63	24,35
<i>Working Capital</i>	5,05	8,88

From the given figures, we find that working capital has increased by ₹ 383 Lacs. What are the reasons of such increase?

Fund Flow Statement explains the reasons for such change.

Funds may be compared with water tank. It contains a particular water level to which there is inflow of water as well as outflow. If inflow is more than outflow water level will go up and if outflow is more than inflow then water level will come down.

Similarly, there is a particular fund level at the Balance Sheet date. Throughout the year there are fund inflows and outflows. So fund experiences a continuous change through the year. At the end of the year, i.e., at the next balance sheet date fund stands at a particular level. If we want to measure the difference between the two dates i.e. Working capital in the first Balance sheet date and Working capital at the next Balance sheet date. This will be given by the differences of the Total Fund Inflows and Total Fund Outflows.

3.15.2 Change in Working Capital: Even when a firm is earning adequate profit it may be short of fund for day to day working. Such a situation may be the result of:

- (a) Purchase of fixed assets or long-term investments during the phase of extension without raising long-term funds by issue of shares or debentures;
- (b) Payment of dividends in excess of profits earned;
- (c) Extension of credit to the customers;
- (d) Holding larger stock to the current levels; and
- (e) Repaying a long-term liability or redemption of preference shares without raising long-term resources.

Conversely, even in a year of loss, working capital may not diminish as much as the amount of loss less depreciation due to many reasons. Change in Working Capital Statement is usually prepared to show any change in working capital between two consecutive Balance Sheet dates.

Example: Given below is the Change in Working Capital Statement of the same company as an example:

Change in Working Capital Position

	(Rupees in Lacs)		
<i>Current Assets, Loans & Advances</i>	<i>31.3.2013</i>	<i>31.3.2014</i>	<i>Change</i>
<i>Inventories</i>	15,24	14,91	- 33

<i>Sundry Debtors</i>	1,26	1,83	+ 57
<i>Cash and Bank</i>	1,34	1,66	+ 32
<i>Other Current Assets</i>	8	9	+ 1
<i>Loans and Advances</i>	11,76	14,74	+ 298
	29,68	33,23	355
<i>Less : Current Liabilities and Provisions</i>			
<i>Liabilities</i>	17,76	14,83	- 293
<i>Provision for Taxation</i>	6,22	7,45	+ 123
<i>Proposed Dividend</i>	65	2,07	+ 142
	24,63	24,35	- 28
<i>Working Capital</i>	505	888	383
			= [355 - (-28)]

[Students may note that in Fund Flow Analysis, sometimes provisions for taxation and proposed dividend are excluded from current liabilities. This is just to show the true payments as outflows.]

3.15.3 Elements of Funds Flow Statement: We have already seen that there are numerous movements in funds in an accounting year. It is important to understand these movements since they affect the financial position of a company. This is done by preparing a statement known as Funds Flow Statement, also known as Sources and Application of Funds Statement or the Statement of Changes in Financial Position. There is no prescribed form in which the statement should be prepared. However, it is customary to draw it in a manner as would disclose the main sources of funds and their uses. It shows the various sources and uses of funds during a year. Some of those sources and application are listed below:

There is no prescribed form in which the statement should be prepared. However, it is customary to draw it in a manner as would disclose the main sources of funds and their uses.

3.15.3.1 Sources of Funds

(i) **Issue of shares and debentures for cash:** If shares or debentures are issued at par, the paid-up value constitutes the source of fund. If shares/debentures are issued at a premium, such premium is to be added and if shares/debentures are issued at a discount, such discount is to be subtracted to determine the source of fund.

But issue of bonus shares, conversion of debentures into equity shares or shares issued to the vendors in case of business purchases do not constitute sources of fund.

(ii) **Long-term Loans:** Amount of long-term loan raised constitutes source of fund. But if a long-term loan is just renewed for an old loan, then the money received by such renewal becomes the source.

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(iii) **Sale of investments and other fixed assets:** Sale proceeds constitute a source of fund.

Illustration 5: An old machine costing ₹ 8 Lacs, W.D.V. ₹ 2 Lacs was sold for ₹ 1.75 Lacs. Here source of fund was only ₹ 1.75 lakhs.

(iv) **Fund from Operations:** Fund generated from operations is calculated as below:

Net Income

Additions

1. Depreciation of fixed assets
2. Amortization of intangible and deferred charges (i.e. amortization of goodwill, trademarks, patent rights, copyright, discount on issue of shares and debentures, on redemption of preference shares and debentures, preliminary expenses, etc.)
3. Amortization of loss on sale of investments
4. Amortization of loss on sale of fixed assets
5. Losses from other non-operating items
6. Tax provision (created out of current profit)
7. Proposed dividend
8. Transfer to reserve

Subtraction

1. Deferred credit (other than the portion already charged to Profit and Loss A/c)
2. Profit on sale of investment
3. Profit on sale of fixed assets
4. Any subsidy credited to P & L A/c.
5. Any written back reserve and provision.

Here, Fund from Operations, is calculated after adding back tax provision and proposed dividend. Students should note that if provision for taxation and proposed dividend are excluded from current liabilities, then only these items are to be added back to find out the 'Fund from Operations'. By fund from operations if we want to mean gross fund generated before tax and dividend, then this concept is found useful. At the same time, fund from operations may also mean net fund generated after tax and dividend. For explaining the reasons for change in fund it would be better to follow the gross concept.

(v) **Decrease in Working Capital:** It is just for balancing the Fund Flow Statement. This figure will come from change in working capital statement.

3.15.3.2 Applications of Funds

(i) **Purchase of fixed assets and investments:** Cash payment for purchase is application of fund. But if purchase is made by issue of shares or debentures, such will not constitute application of fund. Similarly, if purchases are on credit, these will not constitute fund applications.

- (ii) **Redemption of debentures, preference shares and repayment of loan:** Payment made including premium (less: discount) is to be taken as fund applications.
- (iii) **Payment of dividend and tax:** These two items are to be taken as applications of fund if provisions are excluded from current liabilities and current provisions are added back to profit to determine the 'Fund from Operations'.
- (v) **Increase in working capital:** It is the balancing figure. This figure will come from change in working capital statement.

3.15.3.3 Calculation of Funds from Operations

Example

Profit and Loss Account

	₹		₹
To Stock	2,90,000	By Sales	50,20,000
To Purchases	27,30,000	By Stock	3,40,000
To Wages	10,10,000	By Interest Received	10,000
To Salaries & Admn. Exp.	6,35,000	By Transfer from Div.	
To Depreciation	2,70,000	Equalisation Reserve	2,00,000
To Investment Reserve	1,20,000	By Profit on sale of	
To Patents	15,000	Machinery	20,000
To Provision for Income-Tax	2,70,000		
To Net Profit	2,50,000		
	55,90,000		55,90,000

Funds generated by trading activities before tax was ₹ 7,05,000 as shown below:

	₹	₹
Net Profit (after tax)	2,50,000	
Add: Non-cash charges		
Depreciation	2,70,000	
Patents written off	15,000	
Investment Reserve	1,20,000	4,05,000
Less: Transfer from Dividend		6,55,000
Equalisation Reserve	2,00,000	
Profit on sale of machinery	20,000	2,20,000
		4,35,000
Add: Provision for income tax		2,70,000
		7,05,000

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3.15.3.4 Funds Flow from Opening Balance Sheet: The balance sheet at the end of the very first year of operations of a business is more or less the fund flow statement for that year. Suppose the balance sheet at the end of the year of a business is as follows:

<i>Liabilities</i>	₹	<i>Assets</i>	₹
Share Capital	8,00,000	Fixed Assets	12,00,000
Profit & Loss A/c	20,000	<i>Less: Depreciation</i>	1,00,000
8% Debentures	3,00,000		11,00,000
Sundry Creditors	2,00,000		
Bills Payable	1,00,000	Sundry Debtors	2,00,000
Provision for Taxation	1,00,000	Stock-in-trade	2,00,000
Proposed Dividend	80,000	Cash at Bank	1,00,000
		Preliminary Exp.	20,000
		<i>Less : Written off</i>	20,000
	16,00,000		16,00,000

The Fund Flow Statement of the above mentioned business will be as follows:

Sources of Fund	₹		₹
Share Capital			8,00,000
8% Debentures			3,00,000
Fund from Operations:			
P & L A/c		20,000	
<i>Add: Depreciation</i>		1,00,000	
Preliminary Exp. w/o		20,000	
Provision for Taxation		1,00,000	
Proposed Dividend		80,000	3,20,000
			14,20,000
Applications of Fund			
Purchase of Fixed Assets		12,00,000	
Payment of Preliminary Expenses		20,000	
Working Capital		2,00,000	
			14,20,000

3.15.4 Analysis of Funds Flow Statement: Fund Flow Statement is prepared to explain the change in the working capital position of a business.

Particularly there are two flows of funds (inflow):-

- a) Long term fund raised by issue of shares, debentures or sale of fixed assets and
- b) Fund generated from operations which may be taken as a gross before payment of dividend and taxes or net after payment of dividend and taxes.

Applications of fund are for investment in fixed assets or repayment of capital.

If long-term fund requirement is met just out of long-term sources, then the whole fund generated from operations will be represented by increase in working capital. On the other hand, if fund generated from operations is not sufficient to bridge a gap of long-term fund requirement, then there will be a decline in working capital.

3.15.5 Benefits of Funds Flow Statement: Funds flow statement is useful for long term analysis. It is a very useful tool in the hands of management for judging the financial and operating performance of the company. The balance sheet and profit and loss account failed to provide the information which is provided by funds flow statement i.e., changes in financial position of an enterprise. Such an analysis is of great help to management, shareholders, creditors, brokers etc.

1. The funds flow statement helps in answering the following questions:
 - (a) Where have the profits gone?
 - (b) Why there is an imbalance existing between liquidity position and profitability position of the enterprise?
 - (c) Why is the concern financially solid in spite of losses?
2. A projected funds flow statement can be prepared and resources can be properly allocated after an analysis of the present state of affairs. The optimal utilisation of available funds is necessary for the overall growth of the enterprise. The funds flow statement prepared in advance gives a clear-cut direction to the management in this regard. The projected funds flow statement can be prepared and budgetary /capital expenditure control can be exercised in the organisation.
3. The funds flow statement analysis helps the management to test whether the working capital has been effectively used or not and whether the working capital level is adequate or inadequate for the requirement of business. The working capital position helps the management in taking policy decisions regarding dividend etc.
4. The funds flow statement analysis helps the investors to decide whether the company has managed funds properly. It also indicates the credit worthiness of a company which helps the lenders to decide whether to lend money to the company or not. It helps management to take policy decisions and to decide about the financing policies and capital expenditure programme for future.

3.15.6 Funds Flow Statement versus Cash Flow Statement: Both funds flow and cash flow statements are used in analysis of past transactions of a business firm. The differences between these two statements are given below:

- (a) Funds flow statement is based on the accrual accounting system. In case of preparation of cash flow statements all transactions effecting the cash or cash equivalents only is taken into consideration.

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- (b) Funds flow statement analyses the sources and application of funds of long-term nature and the net increase or decrease in long-term funds will be reflected on the working capital of the firm. The cash flow statement will only consider the increase or decrease in current assets and current liabilities in calculating the cash flow of funds from operations.
- (c) Funds Flow analysis is more useful for long range financial planning. Cash flow analysis is more useful for identifying and correcting the current liquidity problems of the firm.
- (d) Funds flow statement tallies the funds generated from various sources with various uses to which they are put. Cash flow statement starts with the opening balance of cash and reach to the closing balance of cash by proceeding through sources and uses.

Illustration 12: Given below is the Balance Sheet of X Ltd. as on 31st March, 2012, 2013 and 2014.

Liabilities	31st March			Assets	31st March		
	2012	2013	2014 (₹ in Lacs)		2012	2013	2014 (₹ in Lacs)
Share Capital	70,00	75,00	75,00	Plant & Machinery	80,00	110,00	130,00
Reserve	12,00	16,00	25,00	Investments	35,00	30,00	45,00
Profit & Loss A/c	6,00	7,00	9,00	Stock	15,00	15,00	20,00
12% Debentures	10,00	5,00	10,00	Debtors	5,00	5,50	5,00
Cash Credit	5,00	7,00	12,00	Cash at Bank	5,00	3,00	3,25
Creditors	12,00	14,00	18,00				
Tax Provision	11,00	17,00	28,00				
Proposed Div.	14,00	22,50	26,25				
	140,00	163,50	203,25		140,00	163,50	203,25
Other Information:							

- (i) Depreciation: 2011-2012 ₹ 500 lacs; 2012-13 ₹ 700 lacs; and 2013-14 ₹ 775 lacs.
- (ii) In 2012-13 a part of the 12% debentures was converted into equity at par.
- (iii) In the last three years there was no sale of fixed assets.
- (iv) In 2012-13 investment costing ₹ 500 lacs was sold for ₹ 510 lacs. The management is confused on the deteriorating liquidity position despite good profit earned by the enterprise. Identify the reasons. Fund Flow Analysis may be adopted for this purpose.

Solution

- (1) Working Capital of X Ltd. during 2011-12, 2012-13 and 2013-14

Current Assets :

	2011-12	2012-13	2013-14 (₹ in Lacs)
Stock	15,00	15,00	20,00

Debtors	5,00	5,50	5,00
Cash at Bank	<u>5,00</u>	<u>3,00</u>	<u>3,25</u>
	<u>25,00</u>	<u>23,50</u>	<u>28,25</u>
<i>Less : Current Liabilities :</i>			
Cash Credit	5,00	7,00	12,00
Creditors	12,00	14,00	18,00
	17,00	21,00	30,00
Working Capital	8,00	2,50	(1,75)
Decrease in Working Capital	—	5,50	4,25

So working capital decreased by ₹ 550 lacs in 2008-09 and ₹ 425 lacs in 2013-14.

(2) Profit earned and funds from operations

	2012-13	2013-14
	(₹ in Lacs)	
<i>Profit during the year :</i>		
Increase in Profit & Loss A/c	1,00	2,00
Increase in Reserve	4,00	9,00
Tax provision	17,00	28,00
Proposed Dividend	<u>22,50</u>	<u>26,25</u>
	44,50	65,25
<i>Less : Profit on sale of Investment</i>	(10)	—
<i>Add : Depreciation</i>	<u>7,00</u>	<u>7,75</u>
Fund from operations	<u>51,40</u>	<u>73,00</u>

X Ltd. earned ₹ 44,50 lacs profit and ₹ 51,40 Lacs fund in 2012-13. It earned ₹ 62,25 lacs profit and ₹ 73,00 lacs fund in 2013-14.

(3) Fund Flow Statements

	2012-13	2013-14
	(₹ in Lacs)	
Sources:		
Fund from operations	51,40	73,00
Issue of 12% debentures	—	5,00
Sale of investments	<u>5,10</u>	<u>—</u>
	<u>56,50</u>	<u>78,00</u>

Applications:			
Purchase of Plant and Machinery	37,00	27,75	
Purchase of Investments	—	15,00	
Tax payment	11,00	17,00	
Dividend payment	<u>14,00</u>	<u>22,50</u>	
	<u>62,00</u>	<u>82,25</u>	
Decrease in Working Capital	<u>5,50</u>	<u>4,25</u>	

Comments:

(1) It appears (₹ 25,00 lacs) that 48.64% (₹ 51,40 lacs) $\times 100$ of the fund generated during 2012-13 were used to pay tax and dividend. The percentage became still higher (54.11%)

$$\frac{₹ 39,50}{₹ 73,00} \times 100 \text{ in 2013-14}$$

(2) In 2012-13 the balance of the fund generated was 51.36% (100 – 48.64%) which is used to finance purchase of plant and machinery. Sources of finance for long-term investment were:

Fund from Operations	71.35% (₹ 26,40 lacs/₹ 37,00 lacs) $\times 100$
Sale of Investments	13.78% (₹ 5,10 lacs / ₹ 37,00 lacs) $\times 100$
Working Capital	14.87% (₹ 5,50 lacs / ₹ 37,00 lacs) $\times 100$

Thus inadequate long-term fund to finance purchase of plant and machinery deteriorated working capital position. Also the management proposed 30% dividend in 2012-13.

So, liquidity deterioration in 2012-13 was due to (a) deployment of working capital in long term investment and (b) high rate of dividend.

(3) In 2013-14, fund generation was 42.02% more. But dividend was increased from 20% to 30% which absorbed about 30.83% of funds generated. Tax paid to fund generated was also increased from 21.40% to 23.29%, Investment in Plant & Machinery (net of collection by issue of debentures) was 31.16% of the fund generated. Thus, margin of 14.73 would remain had there been no investment outside business. This amounts to ₹ 10.75 lacs. So outside investment caused liquidity deterioration in 2013-14.

Illustration 13: Given below are the balance sheets of Spark Company for the years ending 31st July, 2013 and 31st July, 2014.

Balance Sheet for the year ending on 31st July

	(₹) 2013	(₹) 2014
Capital and Liabilities		
Share capital	3,00,000	3,50,000
General reserve	1,00,000	1,25,000
Capital reserve (profit on sale of investment)	-	5,000
Profit and loss account	50,000	1,00,000
15% Debentures	1,50,000	1,00,000
Accrued expenses	5,000	6,000
Creditors	80,000	1,25,000
Provision for dividend	15,000	17,000
Provision for taxation	<u>35,000</u>	<u>38,000</u>
Total	<u>7,35,000</u>	<u>8,66,000</u>
Assets		
Fixed Assets	5,00,000	6,00,000
Less: Accumulated depreciation	1,00,000	1,25,000
Net fixed assets	4,00,000	4,75,000
Long-term investments (at cost)	90,000	90,000
Stock (at cost)	1,00,000	1,35,000
Debtors (net of provisions for doubtful debts of ₹ 20,000 and ₹ 25,000 respectively for 2013 and 2014)	1,12,500	1,22,500
Bills receivables	20,000	32,500
Prepaid expenses	5,000	6,000
Miscellaneous expenditure	<u>7,500</u>	<u>5,000</u>
Total	<u>7,35,000</u>	<u>8,66,000</u>

Additional Information:

- (i) During the year 2014, fixed asset with a net book value of ₹ 5,000 (accumulated depreciation ₹ 15,000) was sold for ₹ 4,000.
- (ii) During the year 2014, investments costing ₹ 40,000 were sold, and also investments costing ₹ 40,000 were purchased.
- (iii) Debentures were retired at a premium of 10 percent.
- (iv) Tax of ₹ 27,500 was paid for 2013.

3.76 Financial Management

(v) During 2014, bad debts of ₹ 7,000 were written off against the provision for doubtful debt account.

(vi) The proposed dividend for 2013 was paid in 2014.

You are required to prepare a funds flow statement (i.e. statement of changes in financial position on working capital basis) for the year ended 31st July, 2014.

Solution

Funds Flow Statement for the year ended 31st July, 2014

		(₹)
Sources		
Working capital from operations	1,71,000	
Sale of fixed asset	4,000	
Sale of investments	45,000	
Share capital issued	<u>50,000</u>	
Total Funds Provided		2,70,000
Uses		
Purchase of fixed assets	1,20,000	
Purchase of investments	40,000	
Payment of debentures (at a premium of 10%)	55,000	
Payment of dividend	15,000	
Payment of taxes	<u>27,500</u>	
Total Funds Applied		<u>2,57,500</u>
Increase in Working Capital		12,500

Working Notes:

(a) **Funds from Operations:**

	₹
Profit and loss balance on 31 st July, 2014	1,00,000
Add: Depreciation	40,000
Loss on sale of asset	1,000
Misc. expenditure written off	2,500
Transfer to reserve	25,000
Premium on redemption of debentures	5,000
Provision for dividend	17,000
Provision for taxation	<u>30,500</u>

Less: Profit and loss balance on 31 st July, 2013	2,21,000
Funds from Operations	<u>50,000</u>
	<u>1,71,000</u>

(b) Depreciation for the year 2014 was ₹ 40,000. The accumulated depreciation on 31st July, 2013 was ₹ 1,00,000 of which ₹ 15,000 was written off during the year on account of sale of asset. Thus, the balance on 31st July, 2014 should have been ₹ 85,000. Since the balance is ₹ 1,25,000, the company would have provided a depreciation of ₹ 40,000 (i.e. ₹ 1,25,000 – ₹ 85,000) during the year 2014.

(c) Fixed assets were of ₹ 5,00,000 in 2013. With the sale of a fixed asset costing ₹ 20,000 (i.e. ₹ 5,000 + ₹ 15,000) this balance should have been ₹ 4,80,000. But the balance on 31st July, 2014 is ₹ 6,00,000. This means fixed assets of ₹ 1,20,000 were acquired during the year.

(d) Profit on the sale of investment, ₹ 5,000 has been credited to capital reserve account. It implies that investments were sold for ₹ 45,000 (i.e. ₹ 40,000 + ₹ 5,000).

The provision for taxation during the year 2014 is ₹ 30,500 [i.e. ₹ 38,000 – (₹ 35,000 – ₹ 27,500)].

Bad debts written off against the provision account have no significance for funds flow statement, as they do not affect working capital.

Illustration 14: The summarized Balance Sheet of Xansa Ltd. as on 31-12-2012 and 31-12-2013 are as follows:

	31-12-2012	31-12-2013
Assets		
Fixed assets at cost	8,00,000	9,50,000
Less: Depreciation	<u>2,30,000</u>	<u>2,90,000</u>
Net	<u>5,70,000</u>	<u>6,60,000</u>
Investments	1,00,000	80,000
Current Assets	2,80,000	3,30,000
Preliminary expenses	<u>20,000</u>	<u>10,000</u>
	<u>9,70,000</u>	<u>10,80,000</u>
Liabilities		
Share Capital	3,00,000	4,00,000
Capital reserve	–	10,000
General reserve	1,70,000	2,00,000
Profit & Loss account	60,000	75,000
Debentures	2,00,000	1,40,000
Sundry Creditors	1,20,000	1,30,000
Tax Provision	90,000	85,000

3.78 Financial Management

<i>Proposed dividend</i>	30,000	36,000
<i>Unpaid dividend</i>	—	4,000
	<u>9,70,000</u>	<u>10,80,000</u>

During 2013, the company –

- (a) Sold one machine for ₹ 25,000 the cost of the machine was ₹ 64,000 and depreciation provided for it amounted to ₹ 35,000.
- (b) Provided ₹ 95,000 as depreciation.
- (c) Redeemed 30% of debentures at ₹ 103.
- (d) Sold investments at profit and credited to capital reserve; and
- (e) Decided to value the stock at cost, whereas earlier the practice was to value stock at cost less 10%. The stock according to books on 31-12-2012 was ₹ 54,000 and stock on 31-12-2013 was ₹ 75,000, which was correctly valued at cost.

You are required to prepare the following statements:

- (i) Funds from Operations
- (ii) Sources and application of funds and statement of changes in working capital.
- (iii) Fixed assets account and loss on sale of machinery account.

Solution

Working Notes:

Fixed Assets A/c

	₹		₹
To Balance b/d	8,00,000	By Sale of Machinery A/c	64,000
To Cash Purchases (Bal. figure)	<u>2,14,000</u>	By Balance c/d	<u>9,50,000</u>
	<u>10,14,000</u>		<u>10,14,000</u>

Sale on Machinery A/c

	₹		₹
To Fixed Assets (original cost)	64,000	By Provision for Depreciation (provided till date)	35,000
	—	By Cash (sales)	25,000
	<u>64,000</u>	By Loss (P & L A/c)	<u>4,000</u>
			<u>64,000</u>

Provision for Depreciation of Fixed Assets A/c

	₹		₹
To Sale of Machinery a/c	35,000	By Balance b/d	2,30,000
To Balance c/d	<u>2,90,000</u>	By Profit & Loss A/c	<u>95,000</u>
	<u>3,25,000</u>		<u>3,25,000</u>

Statement of Funds generated from Operations

	(₹)
Profit & Loss A/c (Carried forward to B/S)	75,000
<i>Add:</i> Fixed Assets (loss on sales)	4,000
Depreciation	95,000
Premium on redemption of Debentures ($60,000 \times 3/100$)	1,800
Preliminary expenses written off	10,000
Provision for Income-tax	85,000
Proposed Dividend	36,000
Transfer to General Reserve	<u>30,000</u>
	<u>2,61,800</u>
	3,36,800
<i>Less:</i>	
Profit and Loss A/c Opening Balance	60,000
Increase in Opening Stock value ($54,000 \times 10/90$)	<u>6,000</u>
Funds generated from operation	<u>2,70,800</u>

Funds flow Statement of Xansa Ltd. for the year ended 31-12-2013

	(₹)
Sources of Funds:	
Issue of Shares	1,00,000
Sale of Investments	30,000
Sale of Machinery	25,000
Funds generated from operations	<u>2,70,800</u>
	Total <u>4,25,800</u>
Application of Funds:	
Purchase of Fixed Assets	2,14,000
Redemption of Debentures with 3% Premium i.e., ($60,000 \times 103/100$)	61,800

3.80 Financial Management

Dividend paid for the last year (₹ 30,000 – ₹ 4,000 unpaid dividend)	26,000
Taxes paid belonging to last year	90,000
Increase in Working Capital (balancing figure)	<u>34,000</u>
Total	<u>4,25,800</u>

Statement of Changes in Working Capital

Particulars	2012	2013	+	-
Current Assets	2,86,000	3,30,000	44,000	-
(including 6,000 on account of revaluation of stock)				
Current Liabilities	1,20,000	1,30,000	-	10,000
Net Working capital	1,66,000	2,00,000		
Increase in Working Capital	34,000	-	-	34,000
	2,00,000	2,00,000	44,000	44,000

SUMMARY

- Financial Analysis and its Tools:-** For the purpose of obtaining the material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise, it is necessary to analyze the data depicted in the financial statement. The financial manager has certain analytical tools which help in financial analysis and planning. The main tools are Ratio Analysis and Cash Flow Analysis.
- Ratio Analysis:-** The ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information. Ratio analysis is not just comparing different numbers from the balance sheet, income statement, and cash flow statement. It is comparing the number against previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.
- Type of Ratios and Importance of Ratios Analysis:-** The ratios can be classified into following four broad categories:
 - Liquidity Ratios
 - Capital Structure/Leverage Ratios
 - Activity Ratios
 - Profitability Ratios
 A popular technique of analyzing the performance of a business concern is that of financial ratio analysis. As a tool of financial management, they are of crucial significance. The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.

Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

- I Liquidity Position
- II Long-term Solvency
- III Operating Efficiency
- IV Overall Profitability
- V Inter-firm Comparison
- VI Financial Ratios for Supporting Budgeting

4. **Cash Flow Statement**:- Simple definition of a cash flow statement is a statement which discloses the changes in cash position between the two periods. Along with changes in the cash position the cash flow statement also outlines the reasons for such inflows or outflows of cash which in turn helps to analyze the functioning of a business. The cash flow statement is an important planning tool in the hands of management. A cash flow statement is useful for short-term planning.
5. **Classification of Cash Flow Activities**:- The cash flow statement should report cash flows during the period classified into following categories:-
 - a. Operating activities
 - b. Investing activities
 - c. Financing activities
 Classification by activity provides information that allows users to assess the impact of those activities on the financial position of the enterprise and the amount of its cash and cash equivalents. This information may also be used to evaluate the relationships **among those activities**.
6. **Funds Flow Statement**:- Another important tool in the hands of finance managers for ascertaining the changes in financial position of a firm between two accounting periods is known as funds flow statement. Funds flow statement analyses the reasons for change in financial position between two balance sheets. It shows the inflow and outflow of funds i.e., sources and application of funds during a particular period.